

# George E. Brown, Jr. Network for Earthquake Engineering Simulation Operations (NEES Ops)

FY 2010 - FY2014

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## Program Solicitation

08-574

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### National Science Foundation

Directorate for Engineering  
Civil, Mechanical and Manufacturing Innovation

**Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

September 03, 2008

In lieu of the Letter of Intent (LOI) FastLane submission requirement specified below, LOIs must be emailed to [jpauschk@nsf.gov](mailto:jpauschk@nsf.gov) by 5:00 p.m. proposer's local time on September 3, 2008. All other LOI preparation instructions remain unchanged.

**Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. proposer's local time):

October 01, 2008

**Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

February 13, 2009

## REVISION NOTES

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## SUMMARY OF PROGRAM REQUIREMENTS

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### General Information

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**Program Title:**

George E. Brown, Jr. Network for Earthquake Engineering Simulation Operations FY 2010 - FY 2014 (NEES Ops)

**Synopsis of Program:**

The Division of Civil, Mechanical and Manufacturing Innovation (CMMI) in the Directorate for Engineering (ENG) of the National Science Foundation (NSF) is soliciting proposals for network-wide leadership, management, operations, and maintenance of the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) from October 1, 2009 through September 30, 2014. NEES is a NSF-supported shared resource of experimental facilities and cyberinfrastructure for research and education to advance knowledge discovery and innovation to reduce losses from earthquakes. The NEES experimental infrastructure comprises a network of 15 earthquake engineering equipment sites, located at universities across the United States, available for testing on-site, in the field, or through telepresence. The NEES equipment sites include shake tables, geotechnical centrifuges, a tsunami wave basin, unique large-scale testing laboratories, and mobile and permanently installed field equipment. The NEES cyberinfrastructure connects the equipment sites, via Internet2, and provides data curation and a curated central data repository; telepresence; simulation, computational, data visualization, and collaborative tools; hybrid (coupled computational and physical) simulation and multi-site hybrid simulation capabilities; user support services; middleware; and a cybersecurity framework.

A single award will be made for NEES operations, as a cooperative agreement, for a duration of five years from October 1, 2009 to September 30, 2014. The awardee will use this NSF support to provide governance, a network-wide management headquarters, and

subawards to the equipment sites and cyberinfrastructure, education, outreach, and other partner organizations based on the awardee's strategic plan, policies and procedures, annual goals and priorities, and the terms and conditions of the cooperative agreement. The NEES equipment sites are not being competed as part of this solicitation and no new equipment sites will be added to NEES as a result of this competition. Cyberinfrastructure operations and education and outreach activities are being competed as part of the award to be made under this solicitation and proposers should address these in their proposal submission. The awardee itself will not conduct research under this cooperative agreement; NSF separately funds researchers and educators to use NEES.

### Informational Meetings and Additional Web-based Information

NSF welcomes proposals from eligible organizations stated in Section IV, "Eligibility Information," of this solicitation and will facilitate the development of proposals through posting a Frequently Asked Questions (FAQ) and a draft of the cooperative agreement for the award to be made under this solicitation, an NSF Town Hall Meeting, and informational facility visit(s). All information about these activities will be posted electronically at the NSF web site <http://www.nsf.gov/div/index.jsp?div=CMMI> as it becomes available. NSF will hold a Town Hall Meeting about this program solicitation on August 8, 2008, at the National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230. The Town Hall Meeting will be an opportunity for potential proposers to acquire information relevant to the development of a proposal and the review process. More information about this meeting will be available at <http://www.nsf.gov/div/index.jsp?div=CMMI>. Proposers interested in attending this meeting should send an email to Joy Pauschke ([jpauschk@nsf.gov](mailto:jpauschk@nsf.gov)) by August 5, 2008, with their name, organizational affiliation, and contact information. In addition, NSF staff will facilitate informational facility visits to one or more of the NEES equipment sites. Proposers interested in visiting a NEES equipment site must contact Joy Pauschke ([jpauschk@nsf.gov](mailto:jpauschk@nsf.gov)) by August 15, 2008. The informational facility visits will be public meetings, scheduled based upon requests, and announced in advance on the NSF web site <http://www.nsf.gov/div/index.jsp?div=CMMI>. Proposers are responsible for their own expenses to attend these meetings and facility visits.

### Cognizant Program Officer(s):

- Joy M Pauschke, Program Director, Division of Civil, Mechanical and Manufacturing Innovation, telephone: (703) 292-7024, email: [jpauschk@nsf.gov](mailto:jpauschk@nsf.gov)
- Kevin Thompson, Program Director, Office of Cyberinfrastructure, telephone: (703) 292-8962, email: [kthomps@nsf.gov](mailto:kthomps@nsf.gov)
- Nakita Y Harris, Grants and Agreements Specialist, Division of Acquisition and Cooperative Support, telephone: (703) 292-2182, email: [nyharris@nsf.gov](mailto:nyharris@nsf.gov)

### Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.041 --- Engineering

### Award Information

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**Anticipated Type of Award:** Cooperative Agreement

**Estimated Number of Awards:** 1

**Anticipated Funding Amount:** \$105,000,000 estimated total for up to five years. The amount available under the cooperative agreement will depend upon the annual budgets of NSF and the performance of the awardee. For the purpose of writing a proposal, assume that the maximum funding (i.e., total annual budget) available is \$20,000,000 in year one, \$20,500,000 in year two, \$21,000,000 in year three, \$21,500,000 in year four, and \$22,000,000 in year five. As part of the total annual budgets listed above, assume collective equipment site operations annual budgets to total \$14,350,000 in year one, \$14,700,000 in year two, \$15,000,000 in year three, \$15,400,000 in year four, and \$15,700,000 in year five. Also, as part of the total annual budgets listed above, assume an annual capital replacement budget of \$650,000 in year one, \$665,000 in year two, \$680,000 in year three, \$695,000 in year four, and \$710,000 in year five. The capital replacement budget provides support for annual major equipment repairs across the NEES equipment sites. Individual equipment site budgets, annual and cumulative, are not required and should not be submitted in preliminary and invited full proposals. The awardee will obtain detailed budgets from each equipment site after the cooperative agreement is awarded and will propose the total annual operating budgets to NSF.

### Eligibility Information

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#### Organization Limit:

Proposals may only be submitted by the following:

- The following organizations may submit preliminary and invited full proposals: (1) Universities and colleges located and accredited in the United States, acting on behalf of their faculty. Such organizations are also referred to as academic institutions; and (2) Non-profit, non-academic organizations located and incorporated within the United States that are directly associated with research activities or that are a non-profit subsidiary of a college or university.

Preliminary and invited full proposals involving more than one organization must be submitted as a single administrative package from the lead organization; collaborative preliminary proposals and collaborative invited full proposals with multiple

administrative packages will not be accepted.

**PI Limit:**

The Principal Investigator (PI) must be a full-time employee of the lead (submitting) organization.

**Limit on Number of Proposals per Organization:**

None Specified

**Limit on Number of Proposals per PI:**

None Specified

**Proposal Preparation and Submission Instructions**

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**A. Proposal Preparation Instructions**

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf/>)

**B. Budgetary Information**

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

**C. Due Dates**

- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

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**Proposal Review Information Criteria**

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**Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

## Award Administration Information

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**Award Conditions:** Additional award conditions apply. Please see the full text of this solicitation for further information.

**Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

## TABLE OF CONTENTS

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### Summary of Program Requirements

- I. **Introduction**
- II. **Program Description**
- III. **Award Information**
- IV. **Eligibility Information**
- V. **Proposal Preparation and Submission Instructions**
  - A. Proposal Preparation Instructions
  - B. Budgetary Information
  - C. Due Dates
  - D. FastLane/Grants.gov Requirements
- VI. **NSF Proposal Processing and Review Procedures**
  - A. NSF Merit Review Criteria
  - B. Review and Selection Process
- VII. **Award Administration Information**
  - A. Notification of the Award
  - B. Award Conditions
  - C. Reporting Requirements
- VIII. **Agency Contacts**
- IX. **Other Information**

## I. INTRODUCTION

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The George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) is the result of more than a decade of planning by the earthquake engineering community. In November 1998, the National Science Board (NSB) approved NEES for construction for \$82,000,000. The National Science Foundation (NSF) funded construction of NEES through the Major Research Equipment and Facilities Construction (MREFC) appropriation during 2000-2004. Construction of 15 experimental facilities at universities across the United States and cyberinfrastructure was completed on September 30, 2004, and NEES opened for operations on October 1, 2004. Since 2004, the NSF Division of Civil, Mechanical and Manufacturing Innovation (CMMI), through annual research program solicitations, has supported over 40 research awards, totaling over \$40,000,000, to utilize NEES. NEES operations is in its fourth year and is currently managed through a NSF cooperative agreement with NEES Consortium, Inc. (NEESinc), (<http://www.nees.org>), hereafter referred to in this program solicitation as the "incumbent awardee." The cooperative agreement with the incumbent awardee was effective on October 1, 2004 and expires on September 30, 2009.

In accordance with the NSB policy on competition (NSB-08-12), this solicitation invites proposals for the network-wide leadership, management, operations, and maintenance of NEES for the five-year period from October 1, 2009 through September 30, 2014. The organization receiving the award made under this program solicitation is hereafter referred to in this solicitation as the "awardee." The awardee is expected to meet the highest standards for service and delivery of research infrastructure to the external user community and to demonstrate a proactive, cost-effective, and efficient approach to performance management. The awardee will work with the equipment sites to advance the experimental capabilities of these facilities that can lead to new research frontiers for NEES. NEES cyberinfrastructure has the potential to transform NEES into a global virtual organization for earthquake research and education. The awardee will leverage the NEES infrastructure to broaden participation in NEES, advance the understanding of earthquake loss reduction by educators and students at all levels and the public, and build strategic national and international partnerships to bring additional capabilities and users to NEES.

## II. PROGRAM DESCRIPTION

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## A. Mission of NEES

NEES is authorized by the U.S. Congress under the National Earthquake Hazards Reduction Program (NEHRP) (<http://www.nehrp.gov>) and the award made under this solicitation will contribute to NSF's participation in NEHRP. As a NEHRP facility supported by NSF, NEES serves as an integral and enabling resource to facilitate research for knowledge discovery and innovation to improve the seismic design and performance of the U.S. civil infrastructure. NEES provides the opportunity for investigators to participate in cutting edge research to extend theory; computational, simulation, and visualization tools; design practice and codes in earthquake engineering; advanced and sustainable technologies for design, rehabilitation, and remediation; experimental simulation techniques and instrumentation; and sensor technology. As an integrated network, NEES offers opportunities for earthquake engineering research to enable or enhance the investigation of problems at the systems level, in a more systematic way than previously possible through use of multiple, independent experimental facilities. The role of NEES in earthquake loss reduction has been highlighted in the following documents:

- *Investing in America's Future, Strategic Plan, FY 2006-2011*, National Science Foundation, September 2006, NSF 06-48, [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf0648](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf0648).
- *Grand Challenges for Disaster Reduction: Priority Interagency Earthquake Implementation Actions*, A Report of the Subcommittee on Disaster Reduction, National Science and Technology Council, [http://www.sdr.gov/185820\\_Earthquake\\_FINAL.pdf](http://www.sdr.gov/185820_Earthquake_FINAL.pdf).
- *George E. Brown, Jr. Network for Earthquake Engineering Simulation Research (NEESR)*, NSF Program Solicitation NSF 08-519, [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf08519](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08519).
- *Preventing Earthquake Disasters: The Grand Challenge in Earthquake Engineering. A Research Agenda for the Network for Earthquake Engineering Simulation (NEES)* (available at [http://www.nap.edu/catalog.php?record\\_id=10799](http://www.nap.edu/catalog.php?record_id=10799)), a report from a panel organized by the National Research Council of the National Academies to develop a long-term agenda for earthquake engineering research needs that is well suited to investigative techniques involving use of the NEES experimental resources.
- *Securing Society against Catastrophic Earthquake Losses: A Research and Outreach Plan in Earthquake Engineering* (available at [http://www.eeri.org/cds\\_publications/securing\\_society.pdf](http://www.eeri.org/cds_publications/securing_society.pdf)), a long term research and outreach agenda for the earthquake engineering field prepared by the Earthquake Engineering Research Institute.

Cyberinfrastructure is becoming increasingly integral to the conduct of research and education across many fields of science and engineering, including earthquake engineering. Information, networking, and communications technology; data technologies; simulation, computation, and data visualization capabilities; collaborative tools; computing systems; and middleware continue to evolve at a rapid rate. NSF envisions NEES as a leading-edge, cyber-enabled initiative. As such, NSF recognizes there will be both challenges and opportunities for the awardee in sustaining a robust, state of the art distributed cyber-environment. The awardee will need to balance tasks required for cyberinfrastructure development associated with retaining a leading edge capability while at the same time providing a production quality platform that must adapt to constantly evolving user needs. Proposers may wish to review the following resources to help formulate cyberinfrastructure operations in their proposal:

- *Cyberinfrastructure Vision for 21st Century Discovery*, National Science Foundation, NSF 07-28, <http://www.nsf.gov/pubs/2007/nsf0728/index.jsp>.
- A Listing of Reports and Workshops about Cyberinfrastructure and Its Impacts, Office of Cyberinfrastructure (OCI), National Science Foundation, <http://www.nsf.gov/od/oci/reports.jsp>.
- Office of Cyberinfrastructure Awards, National Science Foundation, [http://www.nsf.gov/awards/award\\_links.jsp?org=OCI](http://www.nsf.gov/awards/award_links.jsp?org=OCI).
- NEES cyberinfrastructure: main web site, <http://it.nees.org>; software, <http://it.nees.org/software/index.php>; user support, including manuals, <http://it.nees.org/support/index.php>; library, <http://it.nees.org/library/index.php>; and NEEScentral data repository, <http://central.nees.org>.
- *Information Technology within the George E. Brown, Jr. Network for Earthquake Engineering Simulation: A Vision for an Integrated Community*, Task Group on Information Technology Vision of the Board of Directors of NEES Consortium, Inc., April 2007, <http://it.nees.org/documentation/pdf/TGoITVision.pdf>.
- *NEESit Requirements Traceability Matrix (RTM)*, [http://it.nees.org/documentation/pdf/TN-2007-15\\_RTM\\_v1.0.pdf](http://it.nees.org/documentation/pdf/TN-2007-15_RTM_v1.0.pdf).

NEES is part of the portfolio of NSF-supported large facilities available as shared research infrastructure. NSF has published the Large Facilities Manual, NSF 07-38, which provides information about the development, construction, and operations of NSF-supported large facilities (available at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf0738](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf0738)). The awardee is encouraged to partner with other large research facilities to bring additional capabilities to NEES. For example, NEES provides opportunities to partner with another NEHRP facility, the Advanced National Seismic System (ANSS) (<http://www.anss.org>) operated by the U.S. Geological Survey (<http://www.usgs.gov>), and the NSF-supported EarthScope facility (<http://www.earthscope.org>).

## B. Description of NEES

NEES is a distributed research and education infrastructure with headquarters; equipment sites; and cyberinfrastructure, education, and outreach partners located across the United States. The incumbent awardee has its headquarters in Davis, CA, is governed by a Board of Directors and led by a Chief Executive Officer, receives input from advisory committees and user surveys, and has established a number of products, services, policies, and procedures that have guided NEES operations since October 1, 2004. Further information on current operations is available at <http://www.nees.org>.

### Equipment Sites

The 15 NEES equipment sites are located at universities across the United States. Each university locally staffs, manages, operates, and maintains its equipment site and provides user support. Fourteen of the equipment sites house the permanent and mobile field equipment on university property. The exception is the facility operated by the University of California, Santa Barbara, which operates a 24/7 permanently installed field instrumentation in two remote field sites in southern California. During the MREFC phase, the title to all equipment was

vested with the 15 universities; therefore, the federal government does not retain title to any NEES equipment, computers, instrumentation, or sensors. The primary external users of the NEES experimental infrastructure are researchers funded by NSF through the annual NEES research program solicitations, e.g., NSF 08-519 program solicitation referenced above, and other NSF support. During the past three years, NSF support for NEES operations has provided, on the average, six months of equipment site personnel support for shared use research projects funded primarily through the NEES research solicitations. During the other six months, the equipment site can be used by the university for its own faculty's research or for research conducted by others funded by other organizations such as other federal, state, and local agencies; the private sector; and industry trade groups. Users of the equipment sites are responsible for the cost, design, construction, demolition, and removal of their test specimens from the equipment site premises. Users are required to have equipment site personnel review all stages of the intended experiment(s) for feasibility and assignment of roles and responsibilities in order to be granted access to the equipment site for testing.

Table 1 lists for each equipment site: the university that operates the equipment site, the type of facility, and the web site that provides information about the equipment, capabilities, and contacts.

**Table 1 - Current NEES Equipment Sites**

(Note: Contact information for each equipment site can be found by clicking on the institutional web site below, then clicking on "Contact Us" on the site menu.)

Location of NEES Equipment Site	Type of Facility	Institutional Web Site
University at Buffalo, The State University of New York	Shake Tables	<a href="http://nees.buffalo.edu">http://nees.buffalo.edu</a>
University of California, San Diego	Shake Table	<a href="http://nees.ucsd.edu">http://nees.ucsd.edu</a>
University of Nevada, Reno	Shake Tables	<a href="http://nees.unr.edu">http://nees.unr.edu</a>
Rensselaer Polytechnic Institute	Geotechnical Centrifuge	<a href="http://nees.rpi.edu">http://nees.rpi.edu</a>
University of California, Davis	Geotechnical Centrifuge	<a href="http://nees.ucdavis.edu">http://nees.ucdavis.edu</a>
Oregon State University	Tsunami Wave Basin	<a href="http://nees.orst.edu">http://nees.orst.edu</a>
Cornell University	Large-Scale Testing	<a href="http://nees.cornell.edu">http://nees.cornell.edu</a>
Lehigh University	Large-Scale Testing	<a href="http://www.nees.lehigh.edu">http://www.nees.lehigh.edu</a>
University of California, Berkeley	Large-Scale Testing	<a href="http://nees.berkeley.edu">http://nees.berkeley.edu</a>
University of Colorado, Boulder	Large-Scale Testing	<a href="http://nees.colorado.edu">http://nees.colorado.edu</a>
University of Illinois, Urbana-Champaign	Large-Scale Testing	<a href="http://nees.uiuc.edu">http://nees.uiuc.edu</a>
University of Minnesota	Large-Scale Testing	<a href="http://nees.umn.edu">http://nees.umn.edu</a>
University of California, Los Angeles	Mobile Field Testing Equipment	<a href="http://nees.ucla.edu">http://nees.ucla.edu</a>
University of Texas, Austin	Mobile Field Testing Equipment	<a href="http://nees.utexas.edu">http://nees.utexas.edu</a>
University of California, Santa Barbara	Instrumented Field Sites	<a href="http://nees.ucsb.edu">http://nees.ucsb.edu</a>

Equipment site operations are supported through subawards to the universities as part of the NSF cooperative agreement with the incumbent awardee. As part of NEES operations, each university hosting an equipment site has the following responsibilities for equipment site operations:

- Develop a productive working partnership with the NEES operations awardee and its partner organizations for all aspects of operations;
- Operate as a shared-use facility, available for experimentation on-site or in the field and through telepresence, for researchers from other organizations. This includes providing equipment, instrumentation, and sensors; data acquisition; local data storage; technician support;

- information technology; space for specimen construction and demolition; and office space for visiting faculty and students;
- Maintain a functioning high performance Internet2 connection;
- Work with the NEES operations awardee to develop annual equipment site goals, work plan, priorities, and budget, in accordance with a work breakdown structure (WBS) and dictionary;
- Hire and supervise the university's equipment site personnel. Staffing at each equipment site typically includes a site Principal Investigator, a full-time site operations manager, a full-time information technology administrator, technician(s), and other technical staff;
- Assign appropriate proportion of the costs for preventive maintenance; calibration; repairs; and equipment, instrumentation, and sensor replacement and upgrades to the NSF-supported NEES operations award and to the university;
- Maintain all equipment, instrumentation, sensors, software, data acquisition, computers, and documentation developed or acquired during the MREFC phase or under the current NEES operations cooperative agreement, including routine calibrations;
- Ensure the physical security of all equipment hardware;
- Maintain an annualized equipment maintenance budget for upgrade or replacement of minor equipment, instrumentation, computers, and sensors;
- Maintain a local web site that has current information for users;
- Maintain an inventory of equipment, instrumentation, sensors, personnel, documentation, contact information, and other information for users in a network-wide equipment site database;
- Participate in education and outreach activities coordinated by the NEES operations awardee;
- Coordinate the scheduling of shared-use research and education projects with the NEES operations awardee;
- Provide periodic equipment site training workshops;
- Support users during all phases of experimentation, which may including planning, instrumentation set-up, testing protocols, testing, local data archiving, and centrally archiving experimental data (users are responsible for curation and permanent data archival in the NEES data repository);
- Assign appropriate user fee structures for academic, industry, government, international, and other researchers for costs not covered by the subaward;
- Comply with all university, government, and/or awardee required environmental, safety, and health standards, regulations, and monitoring requirements, including maintaining safety equipment and web-posted safety plans that equipment site staff and users must follow. Users of the NEES mobile field equipment are responsible for obtaining permits required by the field site and for ensuring that their project complies with all environmental regulations at that test location;
- Comply with all university and NEES operations awardee cybersecurity requirements; and
- Provide individual equipment site information and/or participation needed for the NEES operations awardee to meet the NSF reporting and review requirements listed in section II.C, "Awardee Responsibilities - Core Expectations," of this solicitation.

### *Cyberinfrastructure*

The NEES cyberinfrastructure currently provides data curation and a curated data repository (NEEScentral); telepresence; data visualization tools; simulation and computational tools; a community code repository (NEESforge); collaborative tools for facilitating on-line planning, execution, and post-processing of experiments; hybrid and multi-site simulation software and protocols; a central equipment site inventory database; access to high performance computing; user support services; documentation library; middleware; and a cybersecurity plan and implementation. The NEES data repository serves as the definitive resource that archives data from experiments at the NEES equipment sites. The cyberinfrastructure enables hybrid simulation as well as multi-site experimentation via Internet2. Documentation, software, and the NEES data repository are currently located at the NEES Cyberinfrastructure Center (NEESit) at the University of California, San Diego, San Diego Supercomputer Center. Other partner organizations also contribute to cyberinfrastructure tools, such as the University of California, Berkeley, for the widely used Open System for Earthquake Engineering Simulation (OpenSees) software (<http://opensees.berkeley.edu>), and the equipment sites for hybrid simulation and data visualization tools. Further information about the NEES cyberinfrastructure is available at <http://www.nees.org> and <http://it.nees.org>. The incumbent awardee maintains a cybersecurity plan ([http://it.nees.org/support/security/neesit\\_sec-plan.pdf](http://it.nees.org/support/security/neesit_sec-plan.pdf)) and conducts ongoing cybersecurity checks with the equipment sites.

### *Education, Outreach, and Training*

Since October 2004, NEES education, outreach, and training activities have included the following: (1) one Research Experiences for Undergraduates (REU) site supported by separate NSF grants to the incumbent awardee, which utilizes a subset of the equipment sites and NEESit as host locations for the REU students; (2) organization and conduct of an annual NEES meeting for NEES operations personnel, users, potential users, and others; (3) collaborative partnerships with minority-serving institutions; (4) annual training on the use of the equipment sites, coordinated by the incumbent awardee and conducted by the equipment sites; and (5) broader impact activities incorporated by the equipment sites into ongoing university activities, e.g., summer camps, and by project teams as part of the separately NSF-supported NEES research awards.

### *International Collaborations*

NEES is leveraging and complementing its capabilities through connections and collaborations with large testing facilities at foreign earthquake-related centers, laboratories, and institutions. The Japanese National Research Institute for Earth Science and Disaster Prevention's (NIED) 3-D Full-Scale Earthquake Testing Facility (E-Defense) in Miki, Japan, the world's largest shake table, became operational in 2005. To facilitate NEES/E-Defense collaboration, in September 2005, NSF and the Japanese Ministry of Education, Culture, Sports, Science, and Technology signed a memorandum concerning cooperation in the area of disaster prevention research. To facilitate NEES/E-Defense collaboration, the incumbent awardee and NIED signed a Memorandum of Understanding in August 2005. Several NSF-supported NEES research projects will utilize both NEES facilities and E-Defense in the conduct of their projects during the 2008–2010 timeframe.

## **C. Awardee Responsibilities - Core Expectations**

The awardee is responsible for network-wide leadership and management of NEES operations. To meet the responsibilities associated with NEES operations outlined below, the awardee will provide an oversight governing body; a management headquarters; subawards and oversight to the NEES equipment sites; cyberinfrastructure operations; and education, outreach, and training activities. To provide the breadth of activities and resources needed for cyberinfrastructure operations and education and outreach activities, the lead organization may need to partner with

other organizations and support these partnerships as subawards on the award to be made under this solicitation.

Specifically, the awardee is responsible for providing the following for NEES operations:

**(1) A Network-wide Governing Body**, that (a) provides oversight to the management headquarters on key directions, strategies, priorities, policies, and partnerships; (b) provides annual assessments of the project's progress and plans; (c) ensures that the awardee operates with transparency and accountability to NSF and stakeholders; (d) has membership that avoids conflicts of interest, real or perceived, with the awardee and its partner organizations and consultants supported by the cooperative agreement; and (e) has defined roles, responsibilities, and lines of authority between the management headquarters and the governing body.

**(2) A Network-wide Headquarters** (facility and staff) that provide the day-to-day leadership and management for NEES operations. The headquarters must provide office and meeting space, office equipment, Internet and Internet2 connectivities, and videoconferencing capabilities. Headquarters staff will work collaboratively with the equipment sites and other partners to foster cohesiveness, integration of new ideas, and efficiency of effort, and to prioritize activities and budgets to meet internal user requirements (e.g., cyberinfrastructure needs of the equipment sites) as well as external user requirements (e.g., support for researchers using the equipment sites and telepresence). The specific duties of the headquarters are the following:

- *Provide Qualified Headquarters Staffing*: The headquarters must have the capability to administer an award of this scope, complexity, budget, and number of subawards. The headquarters will serve as the U.S. focal point for all NEES activities. The headquarters may be a stand alone non-profit organization or may be led from a unit within the awardee's organization. Regardless of its position within the awardee's organization, the headquarters must have its own organizational structure, with staff roles, responsibilities, lines of authority, and accountability clearly defined, and must be led by the Principal Investigator (PI). The PI must be a full-time employee of the lead organization. The PI is responsible for leading and managing the headquarters, administering the award in accordance with the terms and conditions of the cooperative agreement, serving as the primary point of contact with NSF program staff, and developing a responsive and cooperative interface with the governing body. The PI may be assisted by a Deputy or Associate Director(s), who shares the leadership and management responsibilities. Personnel responsible for equipment site operations, cyberinfrastructure operations, education and outreach activities, and strategic partnerships must be able to work in a distributed environment and have expertise and demonstrate prior successful activities in these areas during their careers. Education and outreach staff must have credentials appropriate for the educational level to be impacted. Many of the key management positions at headquarters should be full-time positions. The headquarters should have at least one full-time staff member responsible for overall financial administration, with experience in financial management, audit control, subaward management, and procurement. Additional staffing should be provided to carry out the detailed headquarters responsibilities described below;
- *Promote an Active User Base for NEES*, through (a) stakeholder participation that recognizes both external (broader earthquake engineering, computer and information science and engineering, and related communities and practitioners) and internal (equipment sites) groups to ensure that NEES resources, services, products, and activities best reflect their evolving needs and priorities; (b) strategic partnerships with other U.S. and international organizations that bring complementary capabilities and users to NEES; and (c) interactions with earthquake hazard reduction programs at the federal, state, and local government levels and national laboratories;
- *Provide Network-wide Leadership* to develop a vision, mission, goals, and strategic plan for all aspects of NEES operations, informed by stakeholders and updated annually as needed; and
- *Provide Network-wide Management* to implement the strategic plan, to include:
  - *A Work Breakdown Structure (WBS) and Dictionary* that define and organize all NEES operations resources, services, products, and activities and are used annually to allocate resources (budget and personnel);
  - *Development, Review, and Approval Process for Annual Work Plans and Budgets*, for headquarters and all subawards, based on past performance, goals and priorities, WBS, risk management, resource usage, and availability of NSF support;
  - *Published Operating Procedures* for all aspects of operations;
  - *Financial Management and Audit Control*, to ensure appropriate support of NEES' mission and goals, including procurement and subaward management;
  - *A Network-wide Performance Management System and Performance Metrics*, for all aspects of NEES operations, implemented by the awardee, all subawardees, and consultants. The performance management system should include performance metrics and annual performance assessments for all aspects of NEES operations. This would include, but not be limited to, annual self and external assessments; external user satisfaction surveys; equipment site and cyberinfrastructure performance and usage assessment; assessment of the quality of products and services; education and outreach assessments; budget expenditures tracked against planned budgets; user base and demographics data; and documentation of discoveries, innovations, and publications enabled by the use of NEES;
  - *Network-wide Equipment Site Operations and Subaward Management*, as described in item (3) below;
  - *Network-wide Cyberinfrastructure Operations*, as described in item (4) below;
  - *Network-wide Education, Outreach and Training*, as described in item (5) below;
  - *National Science Foundation Reporting and Reviews*, as described in item (6) below;
  - *Inventory (database)* of all infrastructure operated (facilities, software, and databases);
  - *Formal Document Management System*, for document version control for all project documents such as strategic plan, policies and operating procedures, WBS and dictionary, annual work plans, inventories and databases, network-wide maintenance plan, and user manuals;
  - *Risk Management System*, for all aspects of operations; and
  - *User Services*, to assist researchers and educators to discover and use NEES resources during proposal preparation, pre-award review process for project feasibility, post-award access to equipment sites and planning, experimentation, and post-experiment phases, including information on how to start and conduct a project using NEES resources.

**(3) Network-wide Equipment Site Operations and Subaward Management, to include:**

Through subawards, the awardee will provide support to the equipment sites to meet the equipment site responsibilities outlined in Section II.B, "Description of NEES," of this solicitation. However, the level of shared use at each equipment site may vary annually, based on the level of research supported by NSF and other funding sources to utilize each equipment site in any given year. Therefore, a flexible approach to equipment site operations is needed to provide baseline preventive maintenance, calibration, repair, and replacement or upgrade of minor equipment for each equipment site, while at the same time balancing annual fluctuations in site usage. The awardee is responsible for the following activities:



- *Develop Annual Goals, Priorities, Work Plans, and Resource Allocations* for network-wide and individual equipment site operations. Work plan development should take a multi-tier approach to accommodate baseline readiness support at each equipment site early in the federal fiscal year (that starts on October 1) and follow-on site support to assist its users after annual NEES research awards have been made by NSF;
- *Facilitate Linkages and Cooperation* among the individual equipment sites so that they operate as a cohesive national network, collectively advance experimental capabilities, take advantage of economies of scale, and avoid duplication;
- *Maintain Published Policies and Procedures* for equipment site operations and shared facility usage, including a Network-wide Annual Capital Replacement Budget and Policy;
- *Implement Network-wide Solutions* for maintenance, calibration, repair, software, hybrid simulation, technology replacement and upgrades, and new sensor technologies that lead to efficiencies and cost-effectiveness, including a Network-wide Prioritized Long Range Maintenance Plan, updated annually;
- *Track Expenditures* by each equipment site, including annualized equipment maintenance and capital replacement budgets;
- *Coordinate Scheduling* of research and education activities at the equipment sites, including prioritization and rescheduling due to delays or equipment damage;
- *Promote a Network-wide Safety Culture*;
- *Implement a Network-wide Cybersecurity Plan* with the equipment sites; and
- *Provide Oversight*, through headquarter site visit protocols and visits to each equipment site on a regular basis to ensure that equipment sites provide the resources, products, services, activities, and compliance with the items listed in Section II.B, "Description of NEES," in this solicitation.

#### **(4) Network-wide Cyberinfrastructure Operations, to include:**

The NEES cyberinfrastructure must support documented user requirements, be of production quality software and documentation, reflect best practices, maximize the use of commercial off the shelf (COTS) and open source software, leverage investments made by NSF and others in campus and/or national computing resources and cyberinfrastructure tools, and utilize the current NEES cyberinfrastructure where feasible. Cyberinfrastructure partners may include academic institutions; non-profit, non-academic organizations; and for profit organizations.

For cyberinfrastructure operations, the awardee must provide the following:

- *A Baseline Definition of NEES Cyberinfrastructure*, updated annually;
- *A System Architecture* that is cost-effective, efficient, reflects best practices, integrates NEES into an efficient and cohesive system for end users, and provides end-to-end workflow solutions;
- *Documented User Requirements, Process for Prioritizing User Requirements, and a Requirements Traceability Matrix*, including a plan to engage the equipment sites, user community, and other stakeholders to ensure that the cyberinfrastructure addresses user needs and requirements on an ongoing basis;
- *Policies and Procedures* for software development, deployment, testing, operations, maintenance, quality assurance, usability, and use;
- *Production Quality Cyberinfrastructure*, i.e., resources, products, tools, services, software, and documentation that are responsive to user requirements, to include, but not limited to: (1) a state of the art, publicly accessible, searchable, and secured curated repository for research data, as well as metadata, data archiving and sharing policies, data curation, and protocols for accessing, searching, and retrieving data from the repository and assistance to researchers in using the repository; (2) telepresence; (3) data visualization tools; (4) tools for hybrid and multi-site hybrid simulation; (5) simulation and computational tools appropriate for earthquake engineering research and education; (6) web-based collaborative tools for all stages of implementing a project using NEES; (7) facilitated access to and use of campus and/or national computing resources, where appropriate; (8) user support services; (9) software and documentation version control; (10) policies and procedures for cyberinfrastructure operations; and (11) middleware;
- *Network-wide Cybersecurity Plan and Implementation*; and
- *Qualified Cyberinfrastructure Partners*, with demonstrated expertise to develop, deploy and operate cyberinfrastructure, to include use of equipment site personnel to contribute to the development of network-wide cyberinfrastructure.

#### **(5) Network-wide Education, Outreach, and Training, to include:**

NEES provides a unique set of experimental and cyberinfrastructure resources for education and outreach to learn how to reduce the impacts of earthquakes on the built environment and society. A subset of the NEES equipment sites have strong interest and in-house expertise in educational delivery to be designated as "core education nodes" for NEES. The awardee should also partner with other NSF-supported research facilities and other NSF-supported earth science, engineering, cyberinfrastructure, and education projects for education and outreach to avoid duplication of effort and to extend the continuum of scientific and engineering literacy about reducing losses from earthquakes to citizenry of all ages. The awardee is responsible for the following:

- *Providing Core Activities* that leverage the NEES equipment sites and cyberinfrastructure, and other NSF-supported and earthquake-related activities;
- *Qualified Education and Outreach Partners*, with expertise and national accomplishments in formal (K-12, college, and university) and informal science and engineering education;
- *Developing a Broadly Inclusive Science and Engineering Workforce* in all project staffing and activities;
- *Partnering* with non-traditional institutions and non-profit organizations, such as Historically Black Colleges and Universities, Hispanic-Serving Institutions, Indian Tribally Controlled Colleges and Universities, Alaska Native-Serving Institutions, Native-Hawaiian Serving Institutions, and museums;
- *Coordinating and Publicizing Equipment Site and Cyberinfrastructure Training Workshops*;
- *Organizing and Conducting the Annual National NEES Meeting*, which brings together NEES operations personnel, users, potential users, and other stakeholders; and
- *Maintaining an Informational and Dissemination Infrastructure*, to include:
  - *Publications* about significant discoveries, innovations, and technologies that have been enabled by research utilizing NEES resources, both in printed and web-based formats;
  - *Informational Publications* about NEES operations, both in printed and web-based formats; and
  - *Interactive Web Site* for operations that serves as the definitive source of dissemination of information for all activities, is frequently updated, provides a community calendar, and is linked to the individual equipment site web sites.

## **(6) National Science Foundation Reporting and Reviews, to include:**

As an NSF-supported large facility, the awardee is responsible for complying with the terms and conditions of the cooperative agreement, which include providing reports to NSF on time, and participating in NSF-organized merit reviews. The following reporting and review requirements will be the responsibility of the awardee:

- *Annual Work Plans*, for all aspects of NEES operations (headquarters, each equipment site, cyberinfrastructure, education, outreach, and training) that, with the Annual Report and annual budget formulation, serve as the request to NSF for continued annual support;
- *Quarterly and Annual Reporting*, with quarterly reports (submitted to NSF within one month after the end of the quarter) and annual reports (submitted to NSF at least six weeks before the annual review), using the NSF FastLane project-reporting system. The awardee will work with NSF and its partner organizations to streamline the reporting process. Quarterly reports must include the following information: key activities and workshops during the past quarter and planned for the next quarter; changes in key personnel or their level of effort across the project; equipment site usage during the past quarter and planned for next quarter; list of active research projects at each equipment site and the status of each project (e.g., planning phase, specimen construction, testing, etc.); number of days that each equipment site was used for research projects, maintenance and calibration, workshops, and education and outreach activities; cyberinfrastructure usage; minutes from governance and advisory committee meetings; and budget expenditures for the past quarter and cumulative against the planned budget for the reporting year. The annual report shall be submitted in lieu of a fourth quarter report and will be a comprehensive summary of the information provided in the quarterly reports. The annual report will include an assessment of performance against goals and metrics; major accomplishments in advancing earthquake loss reduction, new experimental techniques and cyberinfrastructure; summary of budget expenditures for the past year and anticipated unobligated funds at the end of the reporting year; summary of the results of internal and external evaluations and corrective actions; and goals, priorities, and budget for the upcoming year;
- *Facilities Reporting*, providing estimates and actual information about user units data in FastLane in accordance with the NSF Facilities Reporting under the Government Performance and Results Act (GPRA);
- *Notifications* to NSF, as they occur, of environmental, safety, health, equipment damage/failure, and cybersecurity incidents;
- *Participation in Annual Operations Merit Review Site Visits*, organized by NSF, with external reviewers, to assess fulfillment of annual goals; performance; staffing; upcoming annual and longer term maintenance and operating plans; and compliance with university, government, and/or awardee environmental, health, safety, and cybersecurity requirements;
- *Participation in Merit Review Site Visits of Equipment Site Operations*, organized by NSF, with external reviewers, at individual equipment site universities, approximately three annually, to assess fulfillment of annual goals; performance; staffing; annual and longer term maintenance and operating plans; and compliance with university, government, and/or awardee environmental, health, safety, and cybersecurity requirements; and
- *Participation in Business Systems Review*, conducted by NSF staff, typically once during a five-year award period, with the review to be conducted within the first two years of the award date.

The awardee must collectively demonstrate, in its staffing across the project (exclusive of the locally operated equipment sites), breadth of expertise and prior accomplishments in (1) earthquake engineering research and education; (2) management of complex projects involving a distributed and diverse infrastructure and multiple subawards; (3) strategic planning; (4) business planning, financial administration, procurement, subaward management, and audit control; (5) project management (WBS, annual work plans, resource allocation, performance management and metrics, and schedule); (6) experimental facility operations and maintenance; (7) production quality cyberinfrastructure operations; (8) education and outreach to K-12, college, and university faculty and students, and informal education; (9) responsiveness to a governing body and stakeholders; (10) interactive web site design, deployment, and maintenance; (11) development and implementation of strategic national and international partnerships; and (12) human resource management.

The incumbent awardee has developed a number of policies, procedures, annual work plans, documents, software, and services for operations. These are available at the incumbent's web site at <http://www.nees.org> and <http://it.nees.org>. Proposers should review this information to identify what may be adopted or adapted for operations, where feasible, during 2010 - 2014. The incumbent awardee will cooperate with the awardee to the extent necessary to facilitate uninterrupted support for the equipment sites and cyberinfrastructure operations during the awardee's start-up period and will provide transfer of legal rights to relevant property and equipment, excluding the NEES equipment sites.

## **D. NEES Operations beyond September 30, 2014**

During 2011, NSF intends to support an independent assessment of (1) the accomplishments of NEES operations and NEES research to advance earthquake loss reduction, experimental techniques, and cyberinfrastructure; (2) the viability of NEES equipment sites (on a site by site basis) and cyberinfrastructure to continue to provide state of the art infrastructure beyond September 30, 2014; (3) needed equipment and cyberinfrastructure upgrades; environmental, safety, health, and cybersecurity issues that need to be addressed; and their associated costs to maintain NEES as a state of the art infrastructure beyond September 30, 2014; and (4) earthquake engineering experimental capabilities worldwide. Upon completion of that assessment and based on the awardee's performance, NSF will make a decision whether to upgrade NEES (equipment sites and cyberinfrastructure), renew the cooperative agreement award made under this solicitation for an additional award period, recompute NEES operations, or terminate NEES operations.

## **III. AWARD INFORMATION**

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Anticipated funding is estimated to be \$105,000,000 total for up to five years. The amount available under the cooperative agreement will depend upon the annual budgets of NSF and the performance of the awardee. For the purpose of writing a proposal, assume that the maximum funding (i.e., total annual budget) available is \$20,000,000 in year one, \$20,500,000 in year two, \$21,000,000 in year three, \$21,500,000 in year four, and \$22,000,000 in year five. As part of the total annual budgets listed above, assume collective equipment site operations annual budgets to total \$14,350,000 in year one, \$14,700,000 in year two, \$15,000,000 in year three, \$15,400,000 in year four, and \$15,700,000 in year five. Also, as part of the total annual budgets listed above, assume an annual capital replacement budget of \$650,000 in year one, \$665,000 in year two, \$680,000 in year three, \$695,000 in year four, and \$710,000 in year five. The capital replacement budget provides support for annual major equipment

repairs across the NEES equipment sites. Individual equipment site budgets, annual and cumulative, are not required and should not be submitted in preliminary and invited full proposals. The awardee will obtain detailed budgets from each equipment site after the cooperative agreement is awarded and will propose the total annual operating budgets to NSF.

#### IV. ELIGIBILITY INFORMATION

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##### Organization Limit:

Proposals may only be submitted by the following:

- The following organizations may submit preliminary and invited full proposals: (1) Universities and colleges located and accredited in the United States, acting on behalf of their faculty. Such organizations are also referred to as academic institutions; and (2) Non-profit, non-academic organizations located and incorporated within the United States that are directly associated with research activities or that are a non-profit subsidiary of a college or university.

Preliminary and invited full proposals involving more than one organization must be submitted as a single administrative package from the lead organization; collaborative preliminary proposals and collaborative invited full proposals with multiple administrative packages will not be accepted.

##### PI Limit:

The Principal Investigator (PI) must be a full-time employee of the lead (submitting) organization.

##### Limit on Number of Proposals per Organization:

None Specified

##### Limit on Number of Proposals per PI:

None Specified

#### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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##### A. Proposal Preparation Instructions

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##### Letters of Intent(*required*):

**In lieu of the Letter of Intent (LOI) FastLane submission requirement specified below, LOIs must be emailed to [jpauschk@nsf.gov](mailto:jpauschk@nsf.gov) by 5:00 p.m. proposer's local time on September 3, 2008. All other LOI preparation instructions specified below remain unchanged.**

A Letter of Intent, maximum two pages, is required to facilitate the NSF review process. All Principal Investigators or organizations planning to submit a preliminary proposal must submit a Letter of Intent. The letter must be submitted via FastLane no later than the date specified in this solicitation. Each letter should include the following:

1. Names and locations of the lead and partner organizations, excluding the NEES equipment site academic institutions and locations, unless the academic institution is a partner for aspects of NEES operations in addition to local equipment site operations.
2. Names of the Principal Investigator, co-Principal Investigators, Deputy or Associate Director(s), and other key management staff, including their organizational and departmental or unit affiliations and locations, excluding NEES equipment site personnel whose only role is for local equipment site operations.
3. Principal Investigator's email address and phone number.
4. Proposed location of NEES operations headquarters, if different from the location of the lead organization.

NSF will use the Letters of Intent only to prepare for the proposal review process. NSF will provide via email to the Principal Investigator an acknowledgment of receipt of the Letter of Intent.

##### Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is not required when submitting Letters of Intent
- Submission of multiple Letters of Intent is not allowed

**Preliminary Proposals (required):** Preliminary proposals are required and must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov.

**Table 2**

**Summary of Proposal Preparation Instructions for Preliminary Proposals and Invited Full Proposals**

(See Proposal Preparation Instructions below for preliminary proposals and invited full proposals for more detailed submission requirements; specific information about the individual equipment sites and equipment site personnel whose only role in NEES operations is for local equipment site operations at the university is not requested.)

<b>Proposal Requirement</b>	<b>Preliminary Proposal</b>	<b>Invited Full Proposal</b>
<b>FastLane or Grants.gov Submission</b>	FastLane required	Either FastLane or Grants.gov may be used (FastLane recommended)
<b>Cover Sheet</b>	Required	Required
<b>Title of Proposed Project</b>	Required title: "NEES Operations: FY 2010-FY 2014"	Required title: "NEES Operations: FY 2010-FY 2014"
<b>Project Summary, addressing Intellectual Merit and Broader Impacts</b>	Required	Required
<b>Table of Contents</b>	Required	Required
<b>Project Description Page Length</b>	40-page limit, with pagination	80-page limit, with pagination
<b>Project Description, Section 1, Project Personnel</b>	Required - List personnel receiving two or more months of support in year one, exclusive of equipment site personnel and governing body and other committee members	Required - List personnel receiving one or more months of support in year one, exclusive of equipment site personnel and governing body and other committee members
<b>Project Description, Section 2, Work Breakdown Structure (WBS) and Budget</b>	Required - WBS and budget allocations to level 3	Required - WBS and budget allocations to level 3
<b>Project Description, Section 3, Role of NEES in Advancing Knowledge and Innovation for Earthquake Loss Reduction, Earthquake Engineering Experimentation, and Cyberinfrastructure and Broadening Participation</b>	Required - Three-page maximum	Required - Five-page maximum and provide examples of performance metrics
<b>Project Description, Section 4, Awardee Responsibilities - Core Expectations</b>	Required - Provide strategy and preliminary operating plans to address awardee responsibilities. Do not address NSF Reporting and Reviews	Required - Provide strategy and detailed operating plans to address awardee responsibilities
<b>Project Description, Section 5, Summary of the Value Added by the Proposed Strategy for NEES Operations</b>	Required	Required
<b>Project Description, Section 6, Results from Prior NSF Support</b>	Required for Principal Investigator and co-Principal Investigators	Required for Principal Investigators and co-Principal Investigators
<b>Project Description, Section 7</b>	Required - Evidence of Lead Organization Capability	Optional - Other Supporting Information

<b>Biographical Sketches</b>	Required only for Principal Investigator, co-Principal Investigators, and key management personnel	Required for all personnel who will receive one or more months of support in year one
<b>Budget</b>	Not required; insert place holder budget	Required - Budget forms for lead and all partner organizations receiving \$250,000 or more annually
<b>Current and Pending Support</b>	Required for Principal Investigator, co-Principal Investigators, and key management personnel only	Required for all personnel who will receive one or more months of support in year one
<b>Facilities, Equipment and Other Resources</b>	Not required; do not include	Not required; do not include
<b>Special Information and Supplementary Documentation</b>	Only letters from partner organizations and consultants and only two appendices permitted	Only letters from partner organizations and consultants and only five appendices permitted

### ***Proposal Preparation Instructions for the Preliminary Proposal***

The Preliminary Proposal shall conform to the guidelines specified in the NSF Grant Proposal Guide (GPG) and the preliminary proposal preparation instructions provided below. The complete text of the GPG is available electronically on the NSF website at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). The preliminary proposal preparation instructions below include deviations from the GPG in terms of required proposal sections, project description length, and two allowed appendices.

The following information is required for the Preliminary Proposal:

**Cover Sheet.** A cover sheet must be submitted and electronically signed by an Authorized Organizational Representative for all preliminary proposals. Select the NEES Operations program solicitation from the pull down list. The "preliminary proposal" check box must be selected.

**Title of Proposed Project.** The title of the proposal must be **NEES Operations: FY 2010-FY 2014**. Do not use any other title for the proposed project.

**Project Summary.** This should provide a summary, not more than one page in length, of the key points of the proposal and should be understandable to a scientifically or technically literate lay reader. The project summary should follow the NSF GPG guidelines and must clearly address in separate statements (within the one-page summary), the intellectual merit of the proposed activity and the broader impacts resulting from the proposed activity.

**Table of Contents** will be automatically generated by FastLane.

**Project Description.** The project description should describe the lead organization's strategy and preliminary operating plans for year one of NEES operations to meet the responsibilities outlined in Section II.C, "Awardee Responsibilities - Core Expectations." The project description is limited to **40 pages** and should contain the following sections, in the order listed below. Where noted below, additionally requested material may be included separately in an Appendix to the proposal. Material in the Appendices is not subject to, or included in, the 40-page limit.

#### **Section 1. Project Personnel**

At the start of the project description, provide a table that lists for all personnel with two or more months of anticipated support in year one, the following information: name, professional title, organizational (and departmental, where applicable) affiliation, project title and role, and allocated annual full-time equivalent (FTE) effort. If the name of an individual filling a position is not known at the time of proposal submission, enter "To Be Determined" in the table and the date when that position is expected to be filled. Do not include in the table the names of secretarial staff or personnel from the equipment site subawardees whose only role will be for local operations of the equipment site; these names will be provided to NSF by the awardee after the cooperative agreement is awarded by NSF. Do not include the names of the governing body, advisory committee, or other committee members who will receive less than one month of support in year one or who will only receive travel reimbursement to attend meetings; these members are to be selected by the awardee after the award is made by NSF.

#### **Section 2. Work Breakdown Structure (WBS) and Budget**

Present a preliminary baseline WBS and estimated budget allocations to level 3 for year one operations when the project is at full operations and has exited from the start-up and transition phase. Greater refinement of the WBS is not needed for the preliminary proposal. Include the associated dictionary for the WBS to level 3 in Appendix A. The complete WBS, dictionary, and budget will be provided in the invited full proposal. For the purpose of the preliminary proposal, assume the annual total operations budget, annual collective equipment site operations budget, and annual capital replacement budget to be those listed under Section III, "Award Information," of this solicitation. The WBS, dictionary, and estimated budget allocations are not required for the individual equipment site operations at this time; this information for the equipment sites will be provided to NSF by the awardee after the cooperative agreement is awarded by NSF.

### **Section 3. Role of NEES in Advancing Knowledge and Innovation for Earthquake Loss Reduction, Earthquake Engineering Experimentation, and Cyberinfrastructure and Broadening Participation (three pages maximum)**

Provide examples of key discoveries and innovations for earthquake loss reduction, earthquake engineering experimentation, and cyberinfrastructure and key core activities to broaden participation in research and education that could be enabled by the proposed strategy for NEES operations.

### **Section 4. Awardee Responsibilities - Core Expectations**

Provide the strategy and preliminary operating plans to meet the following responsibilities outlined in Section II.C, "Awardee Responsibilities - Core Expectations," of this solicitation:

1. Network-wide Governing Body
2. Network-wide Headquarters
3. Network-wide Equipment Site Operations and Subaward Management
4. Network-wide Cyberinfrastructure Operations
5. Network-wide Education, Outreach, and Training

For each of these five major responsibilities, identify existing products (e.g., documents, publications, and software), policies, procedures, and services that could be adopted or adapted from the incumbent awardee, where feasible, and discuss the strategy for involving the equipment sites, as appropriate. If invited to submit a full proposal, proposers will develop the strategy and preliminary operating plans in more detail in the full proposal. For the preliminary proposal, proposers are not required to address the awardee responsibilities in Section II.C, for "National Science Foundation Reporting and Reviews."

### **Section 5. Summary of the Value Added by the Proposed Strategy for NEES Operations**

Summarize the value added by the proposed strategy for NEES operations in terms of national and international leadership; network-wide management headquarters structure and staffing; network-wide cohesiveness, synergies, efficiencies, and cost-effectiveness for equipment site and cyberinfrastructure operations; and education, outreach, and training.

**Section 6. Results from Prior NSF Support**, for the Principal Investigator and co-Principal Investigators only, in accordance with the NSF GPG.

### **Section 7. Evidence of Lead Organization Capability (three pages maximum)**

This section provides documentation of the lead organization's internal business, financial, and human resources capability to manage NEES operations within the lead organization.

- Describe the role of NEES operations within the lead organization and the reporting lines of authority of the Principal Investigator within the lead organization. Describe how these lines of authority will be used to provide internal oversight of the cooperative agreement with NSF.
- Discuss the lead organization's business, financial, and internal control systems that would be pertinent to the implementation of the cooperative agreement, including prior evidence of ability related to (a) leading, executing, and monitoring a complex project with 15 or more subawards and (b) submitting reports on time to NSF.
- Describe the human resource system(s) that will be used by the lead organization for staffing and evaluation of its employees' performance on this project.
- Conflict of Interest of Lead Organization. If the lead organization is one of the universities operating a NEES equipment site or will receive \$200,000 or more annually from the award for cyberinfrastructure, education, and outreach, describe the process that the lead organization will use to obtain annual independent assessments of its own project performance, plans, and budgets for these activities.

### **References Cited.**

**Biographical Sketches.** Biographical sketches (biosketches) should be provided for the Principal Investigator, co-Principal Investigators, and key management personnel identified in the Project Description, Section 1, "Project Personnel." Key management personnel are personnel who receive four or more months of support in year one. Do not include the biosketches of any personnel at the NEES equipment sites whose only role will be for local operations of the equipment site. Proposals that are not compliant with the format and information required for biosketches in the NSF GPG will be **returned without review**.

**Budget.** While no budgetary information other than the estimated budget allocations in the Project Description, Section 2, "Work Breakdown Structure (WBS) and Budget," will be required at the preliminary proposal stage, **proposers must complete the required budget form in FastLane by inserting \$1 per year as the place-holder. FastLane will automatically provide a cumulative budget.**

**Current and Pending Support.** Include Current and Pending Support for the Principal Investigator, co-Principal Investigators, and key management personnel only.

**Facilities, Equipment and Other Resources.** This form is not required as the information is asked to be included in the Project Description section

of the preliminary proposal. Proposers do not need to include this form to describe the NEES equipment sites and national and/or campus computing resources.

**Special Information and Supplementary Documentation.** The only documents permitted in this section are letters of commitment specific to this proposal from individuals or from partner organizations on behalf of their employees who are explicitly named in the Project Description, Section 1, "Project Personnel," of the preliminary proposal and the appendices noted below. Any other letters, letters of endorsement, or other information not requested are not to be included.

#### **Appendix A. Work Breakdown Structure (WBS) Dictionary**

In support of the information provided in the proposal in the Project Description, Section 2, "Work Breakdown Structure (WBS) and Budget," provide in this Appendix the WBS dictionary to level 3 only, exclusive of the WBS dictionary for individual equipment site operations.

#### **Appendix B. Conflict of Interest List**

Provide a list, in a single alphabetized table, alphabetized by last name, of the first and last names and institutional affiliations of all individuals with conflicts of interest for all project personnel who are including biosketches in the preliminary proposal. Conflicts to be identified are the following: (1) Ph.D. thesis advisors and advisees; (2) collaborators on a project or co-authors of a book, article, report, or paper within the last 48 months; (3) co-editors of a journal, compendium, or conference proceeding within the last 24 months; and (4) any other individuals or institutions with which project personnel has a business or professional partnership (please specify type).

No other appendices are allowed in preliminary proposals.

Note that when the preliminary proposal is submitted, FastLane will perform a check for all of the standard sections of the proposal. Proposers will receive warning messages that the Facilities, Equipment and Other Resources section has not been completed or uploaded. Proposers should disregard these messages, since this solicitation does not require submission of this section in the preliminary proposal.

**Full Proposal Preparation Instructions:** Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov). Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (<http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf>). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

**Full proposals may be submitted only by those organizations who have submitted a preliminary proposal and subsequently been invited by NSF to submit a full proposal. Full proposals submitted from other organizations that have not received an invitation from NSF to submit a full proposal will be returned without review. Due to the complexity of the proposals being submitted, use of FastLane to prepare and submit invited full proposals is strongly encouraged.**

**The invited full proposal must conform to the guidelines specified in the NSF Grant Proposal Guide (GPG) or the NSF Grants.gov Application Guide (as discussed above), and the invited full proposal instructions detailed below. The invited full proposal preparation instructions below include deviations from the NSF GPG and the NSF Grants.gov Application Guide in terms of required proposal sections, project description length, and five allowed appendices.**

If the invited full proposal contains proprietary or privileged information, then proposers are reminded to review the procedures in the NSF GPG or the NSF Grants.gov Application Guide for indicating that the proposal contains proprietary or privileged information on the proposal Cover Sheet.

The following information is required for the invited full proposal:

**Cover Sheet.** A cover sheet must be submitted and electronically signed by an Authorized Organizational Representative for all invited full proposals. Select the NEES Operations program solicitation from the pull down list.

**Title of Proposed Project.** The title of the proposal must be **NEES Operations: FY 2010-FY 2014**. Do not use any other title for the proposed project.

**Project Summary.** This should provide a summary, not more than one page in length, of the key points of the proposal and should be understandable to a scientifically or technically literate lay reader. This should follow the NSF GPG or NSF Grants.gov Application Guide guidelines and must clearly address in separate statements (within the one-page summary), the intellectual merit of the proposed activity and the broader impacts resulting from the proposed activity.

**Project Description** section of the invited full proposal **should contain the information specified below, in the order listed, and must not exceed 80 pages**. Where noted below, additionally requested material may be included separately in an Appendix to the proposal. Material in the Appendices is not subject to, or included in, the 80-page limit.

### **Section 1. Project Personnel**

At the start of the project description, provide a table that lists for all personnel with one or more months of support in year one, the following information: name, professional title, organizational (and departmental, where applicable) affiliation, project title and role, and allocated annual full-time equivalent (FTE) effort. If the name of an individual filling a position is not known at the time of proposal submission, enter "To Be Determined" in the table and the date when that position is expected to be filled. Do not include in the table the names of secretarial staff or personnel from the equipment site subawardees whose only role will be for local operations of the equipment site; these names will be provided to NSF by the awardee after the cooperative agreement is awarded by NSF. Do not include the names of the governing body, advisory committee, or other committee members who will receive less than one month of support in year one or who will only receive travel reimbursement to attend meetings; these members are to be selected by the awardee after the award is made by NSF.

### **Section 2. Work Breakdown Structure (WBS) and Budget**

Present the baseline WBS and budget allocations to level 3 for year one operations when the project is at full operations and has exited from the start-up and transition phase. The complete WBS, dictionary, and budget allocations for year one at full operations should be provided in Appendix A. The dictionary should fully define the scope of the project, with the exception of the local equipment site operations at the universities. Using the WBS, provide in Appendix A the budget allocation for each WBS element, rolling up the budget at each level. For the purpose of the invited full proposal, assume the year one total operations budget, year one collective equipment site operations budget, and year one capital replacement budget to be those listed under Section III, "Award Information," of this solicitation. The WBS, dictionary, and budget are not required for the individual equipment site operations at this time; this information for individual equipment site operations will be provided to NSF by the awardee after the award is made.

### **Section 3. Role of NEES in Advancing Knowledge and Innovation in Earthquake Loss Reduction, Earthquake Engineering Experimentation, and Cyberinfrastructure and Broadening Participation (five pages maximum)**

Provide examples of key discoveries and innovations for earthquake loss reduction, earthquake engineering experimentation, and cyberinfrastructure and key core activities to broaden participation in research and education that could be enabled by the proposed strategy for NEES operations. Provide examples of performance metrics to be implemented by the awardee that could provide information to develop a compelling basis for continued operations beyond September 30, 2014, in the event that NSF makes a decision for support beyond 2014, as discussed in Section II.D, "NEES Operations beyond September 30, 2014."

### **Section 4. Awardee Responsibilities - Core Expectations**

Provide the strategy and detailed operating plans to meet the following responsibilities outlined in Section II.C, "Awardee Responsibilities - Core Expectations," of this solicitation:

1. Network-wide Governing Body
2. Network-wide Headquarters
3. Network-wide Equipment Site Operations and Subaward Management
4. Network-wide Cyberinfrastructure Operations
5. Network-wide Education, Outreach, and Training
6. National Science Foundation Reporting and Reviews

For each of these six major responsibilities, identify existing products (e.g., documents, publications, and software), policies, procedures, and services that could be adopted or adapted from the incumbent awardee, where feasible, and discuss the strategy for involving the equipment sites, as appropriate.

### **Section 5. Summary of Value Added by the Proposed Strategy for NEES Operations**

Summarize the value added by the proposed strategy for NEES operations in terms of national and international leadership; network-wide management headquarters structure and staffing; network-wide cohesiveness, synergies, efficiencies, and cost-effectiveness for equipment site and cyberinfrastructure operations; and education, outreach, and training.

**Section 6. Results from Prior NSF Support**, for the Principal Investigator and co-Principal Investigators only, in accordance with the NSF GPG or NSF Grants.gov Application Guide.



## Section 7. Other Supporting Information (optional)

Provide any additional information that the lead organization believes will be of assistance in evaluating the proposal but does not fit into any of the sections defined above.

### References Cited.

**Biographical Sketches.** Biographical sketches (biosketches) should be provided for the Principal Investigator, co-Principal Investigators, and each individual named on the project in the Project Description, Section 1, "Project Personnel," exclusive of secretarial personnel. Do not include biosketches for personnel at the NEES equipment sites whose only role will be for local operations of the equipment site. Proposals that are not compliant with the format and information required for biosketches in the NSF GPG or the NSF Grants.gov Application Guide will be **returned without review**.

**Budget.** Provide a budget for each year of requested support. FastLane or Grants.gov will automatically provide a cumulative budget. Proposers should refer to Section V.B, "Budgetary Information," of this solicitation and the NSF GPG or the NSF Grants.gov Application Guide when preparing their budgets. Additional budget justification, up to ten pages maximum, may optionally be included in Appendix E, "Additional Budget Justification."

**Current and Pending Support.** Include Current and Pending Support for the Principal Investigator, co-Principal Investigators, key management personnel, and all other personnel who will receive one or more months of support in year one. Do not include Current and Pending Support information for personnel at the NEES equipment sites whose only role will be for local operations of the equipment site.

**Facilities, Equipment and Other Resources.** This form is not required as the information is asked to be included in the Project Description section of the invited full proposal. Proposers do not need to include this form to describe the NEES equipment sites and national and/or campus computing resources.

**Special Information and Supplementary Documentation.** The only items permitted in this section are letters of commitment to this proposal from individuals or from partner organizations on behalf of their employees who are explicitly named in the Project Description, Section 1, "Project Personnel" and the appendices noted below. Any other letters, letters of endorsement, or other information not requested are not to be included. The following five Appendices are permitted in invited full proposals. No other Appendices are permitted in the proposal, other than the five listed below.

### Appendix A. Work Breakdown Structure (WBS), Dictionary, and Budget Allocations

In support of the information provided in the invited full proposal in the Project Description, Section 2, "Work Breakdown Structure (WBS) and Budget," provide in this Appendix the complete WBS, WBS dictionary, and budget allocated to each WBS element. Provide the budget rolled up at each WBS level.

### Appendix B. Start-up and Transition Plan (fifteen pages maximum)

The year-one budget must include all costs required by the lead and its partner organizations to implement a start-up plan for the period from October 1, 2009 through March 31, 2010, accounting for a six-month transitional overlap in responsibility from the incumbent awardee during this time period. NSF will provide separate funds to the incumbent awardee for this transition period. The transition plan must include the following:

- Activities, with schedule and budget, to be accomplished within the first six months. A high priority activity must be execution of subawards to partner organizations. The start-up plan must include the following deliverables by the deadlines indicated:
  - By November 1, 2009, the year one operating budget proposed to NSF, including budgets for the equipment site subawards and all other subawards;
  - By December 1, 2009, network-wide policies for cybersecurity and safety submitted to NSF;
  - By January 1, 2010, list of all equipment site personnel submitted to NSF;
  - By March 1, 2010, submission to NSF of (a) documented user requirements and requirements traceability matrix and (b) Performance Management System and Performance Metrics for the entire project for review and approval by NSF and implementation by the awardee by April 1, 2010; and
  - By March 31, 2010, submission to NSF of the Risk Management System for the entire project for review and approval by NSF and implementation by the awardee by May 1, 2010;
- Plans for recruitment, orientation, and training of staff members, including the schedule for completing recruitment of all project personnel, exclusive of equipment site personnel at the universities;
- Plans for initial interaction with the NEES equipment sites to establish working relationships, subcontracts, policies, and procedures;
- A plan to acquire office infrastructure (if necessary);
- Management plan for the transfer of inventory, current and previous annual work plans, data repository, software, web site content, maintenance agreements, and other documents from the incumbent awardee. This would include plans for the transfer of responsibilities for operation of the NEES cyberinfrastructure; and
- Criteria that will be used to report to NSF the exit from start-up to full staffing and full operations.

### Appendix C. Evidence of Awardee Organization Capability

This Appendix provides documentation of the lead organization's internal business, financial, and human resources capability to manage NEES operations within the lead organization and the subawards to partner organizations.

- Lines of Authority. Describe the role of NEES operations and the reporting lines of authority of the Principal Investigator within the lead organization. Describe how these lines of authority will be used to provide awardee oversight of all aspects of the project.
- Business and Internal Control Systems. Provide a detailed structure and plan for implementing and monitoring business systems and internal controls for financial management, accounting, property standards, equipment standards, procurement standards, reporting, and records. Include prior evidence of ability to (a) execute and monitor a complex project with multiple subawards and (b) submit quarterly and annual reports on time to NSF.
- Compensation. If the lead organization is a non-profit organization, provide the total compensation plan setting forth proposed salaries and fringe benefits for professional employees, with supporting information such as recognized national and regional compensation surveys, and studies of professional, public, and private organizations used in establishing the total compensation structure.
- Financial Statements. If available, provide the lead organization's annual audited financial statements, (e.g., Balance Sheet, Profit and Loss Statement and Annual Report) for the three most recent fiscal years and/or other documentation to explain its current financial strength and resource capability.
- Indirect Cost Rate and Supporting Financial Data. If the lead organization is not an academic institution and its indirect cost rates have been approved by another federal agency, provide a copy of such agreements.
- Human Resource Systems. Describe the human resource system(s) that will be used by the lead organization for recruiting project personnel, evaluation of its employees on the project, and evaluation of the subawardees' performance under this award. Describe the strategy for the recruitment of project staff from underrepresented groups, including persons with disabilities, and the promotion of diversity within the workforce. Describe any existing barriers to achieving a strong candidate pool for staffing all positions for the project, exclusive of equipment site operations, and how those barriers will be overcome in the recruiting process. Provide the lead organization's minimum qualifications for selection of all key managerial positions that will receive two or more months of annual support, exclusive of the equipment site staffing, and regardless of the employer of that project position. For those key managerial positions that have staff identified at the time of full proposal submission, demonstrate how those staff meet the minimum qualifications. Provide an assessment, from independent sources, of the availability of a robust and qualified workforce for staffing the project within the lead organization's or proposed headquarters office locality.
- Current Cost Accounting Standards Board (CASB) Disclosure Statement, if applicable.

#### Appendix D. Conflict of Interest List

Provide a list, in a single alphabetized table, alphabetized by last name, of the first and last names and institutional affiliations of all individuals with conflicts of interest for all project personnel who are including biosketches in the preliminary proposal. Conflicts to be identified are the following: (1) Ph.D. thesis advisors and advisees; (2) collaborators on a project or co-authors of a book, article, report, or paper within the last 48 months; (3) co-editors of a journal, compendium, or conference proceeding within the last 24 months; and (4) any other individuals or institutions with which project personnel has a business or professional partnership (please specify type).

#### Appendix E. Additional Budget Justification (optional, ten pages maximum)

This Appendix may be used to provide additional budget justification, as needed.

No other appendices are allowed in invited full proposals.

Note that when the invited full proposal is submitted, FastLane or Grants.gov will perform a check for all of the standard sections of the proposal. Proposers will receive warning messages that the Facilities, Equipment and Other Resources section has not been completed or uploaded. Proposers should disregard these messages, since this solicitation does not require submission of this section in the invited full proposal.

## B. Budgetary Information

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**Cost Sharing:** Cost sharing is not required under this solicitation.

**Other Budgetary Limitations:** Proposers should note the following budgetary limitations:

- 1) The year one operations budget must include all costs required by the lead and its partner organizations to provide start-up and transition for the period from October 1, 2009 through March 31, 2010, accounting for the six-month transitional overlap in responsibility from the incumbent awardee. NSF will provide separate funds to the incumbent awardee for this transition period.
- 2) Annual budgets may include a budget for participant support costs, not to exceed \$100,000 annually, to provide travel support for potential users to attend equipment site and cyberinfrastructure training workshops.
- 3) Funds from this award cannot be used to provide severance, retention, or bonus packages for any project personnel supported by this award.

**Budget Preparation Instructions:** The **invited full proposal** must include a budget for each of the five years. FastLane and Grants.gov will automatically provide a cumulative budget.

For the purpose of writing a proposal, assume that the maximum funding available is \$20,000,000 in year one, \$20,500,000 in year two, \$21,000,000 in year three, \$21,500,000 in year four, and \$22,000,000 in year five. Under this scenario, the maximum total funding provided under this cooperative agreement would be \$105,000,000 for the five years. As part of the annual budgets listed above, assume collective equipment site operations budget to total \$14,350,000 in year one, \$14,700,000 in year two, \$15,000,000 in year three, \$15,400,000 in year four, and \$15,700,000 in year five. Also, as part of the annual budgets listed above, assume a capital replacement budget of \$650,000 in year one, \$665,000 in year two, \$680,000 in year three, \$695,000 in year four, and \$710,000 in year five. The capital replacement budget provides support for annual major

equipment repairs across the NEES equipment sites. The awardee will obtain detailed budgets from each equipment site after the cooperative agreement is awarded and will propose the total annual operating budgets to NSF. The assumed budgets for equipment site operations and capital replacement budgets should be included as part of the total level of subcontract support on line G5, subawards, of the FastLane budget or line F5 of the R&R Budget Form in Grants.gov. If the lead organization is one of the universities hosting a NEES equipment site, then subtract out the average equipment site budget from the assumed annual budget for collective equipment site operations from the subaward line and include that average cost as part of the lead organization's budget.

The annual budgets should include the costs for the Principal Investigator and key management personnel to participate in the CMMI Division grantee meetings, held approximately every 18 months.

Excluding the assumed collective equipment site budgets and the assumed capital replacement budget noted above, include separate FastLane budgets for subawards/subcontracts that are \$250,000 or greater annually. For subawards/subcontracts less than \$250,000 annually, include the costs aggregated on the subaward line of the annual budget. In the budget justification, provide a list of all organizations who will receive less than \$250,000 annually and the annual support provided to each organization.

Submitting organizations that have not previously received NSF awards should review the NSF 05-29 Prospective New Awardee Guide available at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=pnag](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=pnag) for additional guidance in preparing their budget submission.

## C. Due Dates

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- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

September 03, 2008

In lieu of the Letter of Intent (LOI) FastLane submission requirement specified below, LOIs must be emailed to [jpauschk@nsf.gov](mailto:jpauschk@nsf.gov) by 5:00 p.m. proposer's local time on September 3, 2008. All other LOI preparation instructions remain unchanged.

- **Preliminary Proposal Due Date(s) (required)** (due by 5 p.m. proposer's local time):

October 01, 2008

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

February 13, 2009

## D. FastLane/Grants.gov Requirements

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- **For Proposals Submitted Via FastLane:**

Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail [fastlane@nsf.gov](mailto:fastlane@nsf.gov). The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

**Submission of Electronically Signed Cover Sheets.** The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

### For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: <http://www.grants.gov/CustomerSupport>. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: [support@grants.gov](mailto:support@grants.gov). The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

**Submitting the Proposal:** Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

## VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

### A. NSF Merit Review Criteria

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All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgements.

#### **What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

#### **What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

NSF staff also will give careful consideration to the following in making funding decisions:

#### ***Integration of Research and Education***

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

#### ***Integrating Diversity into NSF Programs, Projects, and Activities***

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

#### **Additional Review Criteria:**

For both **preliminary proposals** and **invited full proposals**, reviewers will be asked to identify and analyze the following:

- **Strengths** of the proposed strategy and operating plans.
- **Weaknesses** of the proposed strategy and operating plans.
- **Opportunities** that could strengthen the proposed strategy and operating plans.
- **Risks** to the future success of NEES operations in the proposed strategy and operating plans that are not identified or not satisfactorily addressed.
- Capability of the lead organization to lead and manage NEES operations.
- Likelihood that the project personnel (at the lead and partner organizations and consultants) can conduct NEES operations as outlined in section II.C., "Awardee Responsibilities - Core Expectations" of this solicitation, based on project personnel qualifications, evidence of prior accomplishments, level of effort allocated, and comprehensiveness of breadth of expertise provided.
- Extent to which the Work Breakdown Structure (WBS) and dictionary define all activities for NEES operations, as outlined in section II.C., "Awardee Responsibilities - Core Expectations," of this solicitation.
- Appropriateness of the budget allocated to the WBS elements.
- Quality of prior accomplishments in cyberinfrastructure operations and demonstrated ability to develop and maintain an active cyberinfrastructure user base.
- Likelihood that the project personnel will be able to provide cyberinfrastructure for NEES operations that is responsive to user

requirements and the user community.

- . Value added by the proposed strategy for NEES operations in terms of national and international leadership; network-wide management headquarters structure and staffing; and network-wide cohesiveness, synergies, efficiencies, and cost-effectiveness, with respect to
  - . A high level of synergy and leveraging among the headquarters, equipment sites, cyberinfrastructure operations, and education and outreach activities;
  - . Network-wide strategies and solutions; and
  - . Adoption or adaptation, where feasible, of the products, policies, procedures, software, documents, and services developed by the incumbent awardee.

For **preliminary proposals**, reviewers will be asked to evaluate the **quality of and the extent to which** the strategy and preliminary operating plans provided in the proposal address the following awardee responsibilities that are outlined in Section II.C, "Awardee Responsibilities - Core Expectations" of this solicitation, incorporating the NSB-approved merit review criteria of intellectual merit and broader impacts:

1. Network-wide Governing Body
2. Network-wide Headquarters
3. Network-wide Equipment Site Operations and Subaward Management
4. Network-wide Cyberinfrastructure Operations
5. Network-wide Education, Outreach, and Training

For **invited full proposals**, reviewers will be asked to evaluate the **quality of and the extent to which** the strategy and detailed operating plans provided in the proposal address the following awardee responsibilities that are outlined in Section II.C, "Awardee Responsibilities - Core Expectations," of this solicitation, incorporating the NSB-approved merit review criteria of intellectual merit and broader impacts:

1. Network-wide Governing Body
2. Network-wide Headquarters
3. Network-wide Equipment Site Operation and Subaward Management
4. Network-wide Cyberinfrastructure Operations
5. Network-wide Education, Outreach, and Training
6. National Science Foundation Reporting and Reviews

For **invited full proposals**, reviewers will be asked to evaluate the lead organization's ability to assume full responsibility for the leadership and management of NEES operations upon completion of the six-month start-up and transition period without degradation of high quality services.

## B. Review and Selection Process

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Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review, Site Visit Review, or Reverse Site Review.

First, preliminary proposals will undergo a panel merit review, with ad hoc mail reviews as needed. The panel reviews will make recommendations for invitations for full proposals. NSF staff will review these recommendations and select a shortlist of preliminary proposals to be invited by NSF for full proposals. Second, invited full proposals will be evaluated, with additional ad hoc reviews, by a panel and/or either a reverse site visit briefing to a panel at NSF or a site visit to the location of the proposed headquarters or lead organization. NSF will notify the Principal Investigators of all invited full proposals of this second step of the review process with the full proposal invitation. The full proposal invitation will be sent electronically to the Principal Investigator's email address on the preliminary proposal cover sheet. Proposers should plan their schedules to be available for this second step of the merit review process in case they are selected. Site visit dates will not be rescheduled. Any travel and other costs to the site visit by proposers will be the responsibility of the proposers. Third, if needed, NSF may convene a panel for final recommendations. Principal Investigators should make sure that the email address specified for themselves on the cover sheets of the preliminary proposal and invited full proposal are correct and able to receive incoming electronic correspondence.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Acquisition and Cooperative Support for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer.

A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Acquisition and Cooperative Support. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

### B. Award Conditions

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An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); \* or Research Terms and Conditions \* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

\*These documents may be accessed electronically on NSF's Website at [http://www.nsf.gov/awards/managing/award\\_conditions.jsp?org=NSF](http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF). Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=aag](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag).

#### **Special Award Conditions: Programmatic Terms and Conditions: Cooperative Agreement Administration**

The cooperative agreement awarded as a result of this competition will be administered by the CMMI Division in the Directorate for Engineering and the Division of Acquisition and Cooperative Support in the Office of Budget, Finance, and Award Management.

A draft cooperative agreement for the award to be made as the outcome of this program solicitation will be posted at the NSF web site <http://www.nsf.gov/div/index.jsp?div=CMMI>.

The following measures will be used by NSF in providing oversight for this cooperative agreement:

- Review and approval of initial staffing of all key management personnel, including the Principal Investigator, Deputy and/or Associate Director (s), Directors(s) of Equipment Site Operations, Director(s) of Cyberinfrastructure/Information Technology Operations, and Director(s) of Education, Outreach, and Training.
- Review and approval of Annual Work Plans and NSF-required Reports described in Section II.C, "Awardee Responsibilities - Core Expectations" under item (6) "National Science Foundation Reporting and Reviews."
- Review and approval of the Performance Management System and Performance Metrics, and Risk Management System.
- Review and, if required, approval of notifications to NSF about incidents related to environmental, health, and safety requirements; equipment damage/failure; and cybersecurity.
- Annual Operations Merit Review Site Visits, organized by NSF, with external reviewers, to assess fulfillment of annual goals; performance; staffing; upcoming annual and longer term maintenance and operating plans; and compliance with university, government, and/or awardee environmental, health, safety, and cybersecurity requirements.
- Merit Review Site Visits of Equipment Site Operations, organized by NSF, with external reviewers, at individual equipment site universities, approximately three annually, to assess fulfillment of annual goals; performance; staffing; upcoming annual and longer term maintenance and operating plans; and compliance with university, government, and/or awardee environmental, health, safety, and cybersecurity requirements.
- Business Systems Review, typically scheduled once during the five-year award period, with the review to be conducted within the first two years of the award date.

In addition, NSF will review and, if necessary, approve the following:

- Awardee-proposed national and international partnerships that require awardee signature on a Memorandum of Understanding or similar documents; and
- NSF approval for changes in key management positions and equipment site Principal Investigators, rebudgeting of \$100,000 or greater by the awardee or a subawardee, and use of unobligated carryover not intended to be applied to the next year's annual operating budget.

Program-specific terms and conditions not listed above will be negotiated at the time of award.

## C. Reporting Requirements

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For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational) publications; and, other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

Awardee responsibilities to the National Science Foundation with respect to reporting requirements are outlined in Section II.C, "Awardee Responsibilities - Core Expectations," of this program solicitation. Proposers should refer to Section II.C for reporting requirements.

## VIII. AGENCY CONTACTS

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General inquiries regarding this program should be made to:

- Joy M Pauschke, Program Director, Division of Civil, Mechanical and Manufacturing Innovation, telephone: (703) 292-7024, email: [jpauschk@nsf.gov](mailto:jpauschk@nsf.gov)
- Kevin Thompson, Program Director, Office of Cyberinfrastructure, telephone: (703) 292-8962, email: [kthomps@nsf.gov](mailto:kthomps@nsf.gov)
- Nakita Y Harris, Grants and Agreements Specialist, Division of Acquisition and Cooperative Support, telephone: (703) 292-2182, email: [nyharris@nsf.gov](mailto:nyharris@nsf.gov)

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: [support@grants.gov](mailto:support@grants.gov).

## IX. OTHER INFORMATION

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The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, MyNSF (formerly the Custom News Service) is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at <http://www.nsf.gov/mynsf/>.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

**Additional suggested sources of information, in addition to those provided in the program solicitation above, which may be helpful to proposers (not an exhaustive list):**

Current NEES Operations Web Sites, <http://www.nees.org> and <http://it.nees.org>

Digital Library for Earth System Education, <http://www.dlese.org>

nanoHUB, <http://www.nanohub.org>

National Science Digital Library, <http://nsdl.org/>

National Science Foundation, Directorate for Engineering, <http://www.nsf.gov/dir/index.jsp?org=ENG>

National Science Foundation, Division of Civil, Mechanical and Manufacturing Innovation (CMMI), <http://www.nsf.gov/div/index.jsp?div=CMMI>

National Science Foundation, Office of Cyberinfrastructure, <http://www.nsf.gov/dir/index.jsp?org=OCI>

Network for Computational Nanotechnology, <http://www.ncn.purdue.edu/>

NMI Build and Test Lab, <http://nmi.cs.wisc.edu>

Open Science Grid, <http://www.opensciencegrid.org/>

Software Engineering Institute, Carnegie Mellon University, <http://www.sei.cmu.edu>

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

*Facilitation Awards for Scientists and Engineers with Disabilities* provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**



Send an e-mail to: [pubs@nsf.gov](mailto:pubs@nsf.gov)

or telephone: (703) 292-7827

• **To Locate NSF Employees:** (703) 292-5111

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton  
Reports Clearance Officer  
Division of Administrative Services  
National Science Foundation  
Arlington, VA 22230

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