

NSF/ONR Partnership in Electric Power Networks Efficiency and Security (EPNES)

Program Solicitation

NSF-02-188

DIRECTORATE FOR ENGINEERING
DIVISION OF BIOENGINEERING AND ENVIRONMENTAL SYSTEMS
DIVISION OF ELECTRICAL AND COMMUNICATIONS SYSTEMS
DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
DIVISION OF UNDERGRADUATE EDUCATION
DIRECTORATE FOR SOCIAL, BEHAVIORAL, AND ECONOMIC SCIENCES
DIVISION OF SOCIAL AND ECONOMIC SCIENCES

OFFICE OF NAVAL RESEARCH
DEPARTMENT OF ENGINEERING, MATERIALS AND PHYSICAL SCIENCES
DIVISION OF SHIP HULL, MECHANICAL AND ELECTRICAL SYSTEMS

FULL PROPOSAL DEADLINE(S): February 3, 2003

By 5:00 p.m. proposer's local time



NATIONAL SCIENCE FOUNDATION



OFFICE OF NAVAL RESEARCH



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: NSF/ONR Partnership in Electric Power Networks Efficiency and Security (EPNES)

Synopsis of Program: The National Science Foundation (NSF) and the Office of Naval Research (ONR) announce an interdisciplinary solicitation aimed at building new partnerships focused on achieving efficient and secure electric power networks under uncertain demands. The NSF organizations participating in this solicitation include: the Division of Electrical and Communication Systems (ECS) and Division of Bioengineering and Environmental Systems (BES) of the Directorate for Engineering (ENG); the Division of Social and Economic Sciences (SES) of the Directorate for Social, Behavioral and Economic Sciences (SBE); and the Division of Undergraduate Education (DUE) of the Directorate for Education and Human Resources (EHR). The ONR organizations in this solicitation include the Department of Engineering, Materials and Physical Sciences (EMPS), and the Division for Ship Hull, Mechanical and Electrical Systems (SHMES). NSF and/or ONR will make awards. Electric power systems are prototypical socio-technical systems, meaning that their technical, social, economic, political, and cultural elements are tightly interwoven and impinge directly and forcefully upon each other. The goal of this solicitation is to build interdisciplinary partnerships, which allow more unified, coherent research to ensure reliable, secure, and efficient electric power networks. In addition, this program will address socio-economic issues, environmental issues, new pedagogy and curricula to prepare a future workforce, and development of integrated tools provided by ONR or a credible utility system.

Cognizant Program Officer(s):

- James A. Momoh, NSF/ENG, and Division of Electrical and Communications Systems e-mail: jmomoh@nsf.gov.
- Rajinder Khosla, NSF/ENG, and Division of Electrical and Communications Systems e-mail: rkhosla@nsf.gov.
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Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.076 --- Education and Human Resources
- 47.041 --- Engineering
- 47.075 --- Social, Behavioral and Economic Sciences

ELIGIBILITY INFORMATION

- **Organization Limit:** None
- **Limit on Number of Proposals:** An institution can only submit one proposal for EPNES as the lead institution.
- **PI Eligibility Limit:** The lead Principal Investigator on a proposal submitted by his/her institution may be a co-Principal Investigator on only one other proposal submitted by one other institution.

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 10 - 15
- **Anticipated Funding Amount:** Approximately \$3.45 million (\$3.1 million from NSF and \$.35 million from ONR) is expected in FY 2003, subject to the availability of funds.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Full Proposals:** Standard Preparation Guidelines
 - Standard GPG Guidelines apply.

B. Budgetary Information

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

C. Deadline/Target Dates

- **Letters of Intent (*optional*):** None
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):** February 3, 2003 by 5:00 p.m. proposer's local time.

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
 - Gwendolyn Owens, Administrative Officer, ENG/ECS, telephone: (703) 292-8339, e-mail: gowens@nsf.gov.
 - Fastlane user support services, telephone: (703) 292-8142, e-mail: fastlane@nsf.gov.

PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** National Science Board approved criteria. Additional merit review considerations apply. Please see the full program announcement/solicitation for further information.

AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full program announcement/solicitation for further information.

I. INTRODUCTION

There is an urgent need for the development of innovative methods and conceptual frameworks for analysis, planning, and operation of complex, efficient, and secure electric power networks. If this need is to be met and sustained, then there must be appropriate resources developed and available to teach those who will design, develop, and operate those networks. Hence, pedagogy and curricular improvement must be an integrated component of this activity's evolution. The U.S. depends on electric power – power that is provided through networks that may be as small as a ship or as large as a regional power grid. The next generation of high-performance dynamic and adaptive nonlinear networks, of which power systems are an integral application, will be designed and upgraded with interdisciplinary knowledge for achieving improved survivability, security, reliability, reconfigurability and efficiency.

The NSF/ONR Partnership in Electric Power Networks Efficiency and Security (EPNES) invites proposals to advance electric power networks using systems theory, economics principles, and environmental science. Increasing interest in power engineering education and addressing workforce issues in the deregulated power industry necessitates an interdisciplinary research-based curriculum that prepares engineers, economists, and scientists to plan and operate networks. To accomplish this goal, it must be recognized that these networks are socio-technical systems, meaning that successful functioning depends as much upon social factors as upon technical characteristics. They are a key component of larger efforts to achieve sustainable economic growth on a global scale. The continued security of electric power networks can be compromised not only by technical breakdowns, but also by deliberate sabotage, misguided economic incentives, regulatory difficulties, the shortage of energy production and transmission facilities, and the lack of appropriately trained engineers, scientists and operations personnel.

Addressing these issues requires proposals to engage an interdisciplinary approach, involving engineering, technical and social and economic research. EPNES proposals must also integrate pedagogy and curricular improvement as an evolving component of the activity. NSF seeks to fund research activities that ensure electric power in the U.S. will be continuously available, reasonably priced, and have minimal deleterious environmental impacts. It is hoped that a convergence of socio-economic principles with new system theories and computational methods for systems analysis will lead to development of a more efficient, robust, and secure distributed network system. Proposals responding to this solicitation must (1) plan for testing and refining new concepts and principles against benchmark test system problems (as defined in the topical areas, below); and (2) include major connections to market economics, such as global sustainability.

Proposals submitted under this program solicitation must incorporate concepts that are general enough to test on standard civilian and/or military grand challenge problems. Navy test beds will be provided by the Navy (see detailed description in topical area E, below). The civilian grand challenge problem should be a realistic test bed such as those provided by the Electric Power Research Institute (EPRI) or a credible utility company.

II. PROGRAM DESCRIPTION

This solicitation seeks to obtain major advances in the integration of new concepts in control, modeling, component technology, social and economics theories for electrical power networks' efficiency and security. It also encourages development of new interdisciplinary research-based curriculum and pedagogy that will motivate students' learning and increase their retention across affected disciplines. Research should be carried out in interdisciplinary groups with the objective of generating new concepts and approaches stimulated by the interaction of diverse disciplines. Proposals offering incremental advances of existing technologies are discouraged. Proposals should include interdisciplinary research teams of engineers, scientists, social scientists, economists, and environmental experts as appropriate to the work proposed.

This solicitation seeks to overcome barriers between intellectual disciplines relevant to power networks by introducing the complexity of the networks from the Navy and from the utility power sectors as benchmarked systems. Each proposal must contain the development of pedagogy and education material for undergraduate and graduate level students including laboratories, workshops, lectures, CD-ROM, etc. Proposals should discuss effective ways in which education, outreach and improvements to increase the workforce and interests are all integrated within the interdisciplinary research programs to achieve the broader impacts of the proposed activities.

Five topic areas (A-E) of research and education activities appropriate to this solicitation are listed below. Proposals should address two or more of the listed topics in areas A, B and C. Each proposal must also address the education topic area D, and the benchmark systems topic in Area E.

A. Systems and Security

- **Advanced Systems Theory:** Advanced theories and computer-aided modeling tools to substantiate complex modeling and simulation, advanced adaptive control theory, and intelligent-distributed learning agents with relevant controls for optimal handling of systems complexity and uncertainty.
- **Robust Systems Architectures and Configurations:** Advanced analytical methods and tools for optimizing and testing configurations of functional elements/architectures to include control of power electronics and systems components, complexity analysis, time-domain simulation, dynamic priority load shedding for survivability, and gaming strategies under uncertainties.
- **Security and High-Confidence Systems Architecture:** New techniques and innovative tools for fault-tolerant and self-healing networks, situational awareness smart sensors, and analysis of structural changes. Applications include adaptive control algorithms, systems and component security, and damage control systems for continuity of service during major disruptions.

B. Economics, Efficiency and Behavior

- **Regulatory Constraints and Incentives:** New research ideas that explore the influence of regulations on the economics of electric networks.
- **Risk Assessment, Risk Perceptions, and Risk Management:** Novel methods and applications for linking technical risk assessments, public risk perceptions, and risk management decisions.
- **Public Perceptions, Consumer Behavior, and Public Information:** Innovative approaches that improve public perception of electric power systems through increased publicity and education about the electric power networks.

C. Environmental Issues

- **Environmental Systems and Control:** Innovative environmental sensing techniques for system operation and maintenance, improvements in emission control technologies, and/or network operation for minimization of environmental impact, among others. For proposals responding to this topical area, the interplay of these factors with the other topics in this solicitation is a requirement.

- Technology for Global Sustainability: Cross-disciplinary efforts, which contribute, to the resource and environments transitions need to ensure long-term sustainability of global economic growth.

D. New Curricula and Pedagogy

- New Curricula and Pedagogy: Innovative and integrated curricula and pedagogy incorporating application of advanced system theory, economics, and other social science perspectives, as well as environmental science, policy, and technical issues in research and curriculum are desirable. New and innovative curriculum paradigms to help excite students and faculty, and better prepare the workforce for the power industry of the future is also desirable. Pedagogy and curricula must be developed at the undergraduate and graduate students level.

E. Benchmark Test Systems

- Benchmark Test Systems: Validation of models, advanced theories, algorithms, numerical and computational efficiency, distributed learning agents, robust situational awareness for hierarchical and/or decentralized systems, adaptive controls, self-healing networks, and continuity of service despite faults. Representative test beds will be available from the site: <http://www.cesac.howard.edu/> and in particular, from: the United States Naval Academy, <http://www.usna.edu/EPNES> for proposals relating to the Naval ship baseline system architecture.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the [Grant Proposal Guide](#) are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

The awards made will be up to a total of \$300,000 for a small interdisciplinary group and up to a total of \$600,000 for a large interdisciplinary group. Due to the nature of the program, all proposals must be interdisciplinary, and multiple co-Principal Investigators are encouraged. The award duration may be up to three years. Both small and large interdisciplinary groups may be from the same institution or from different institutions, and should demonstrate substantial program enhancement resulting from the interaction of diverse disciplines. It is anticipated that the total funds available from NSF and ONR for this program in FY 2003 will be approximately \$3.45 million. The anticipated numbers of awards and average award size/duration are subject to the availability of funds and the quality of proposals.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal:

Proposals submitted in response to this program announcement/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 Web Site at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

Proposers are reminded to identify the program solicitation number ([NSF-02-041](#)) in the program announcement/solicitation block on the *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.

B. Budgetary Information

Cost sharing is not required in proposals submitted under this Program Solicitation.

Other Budgetary Limitations: Proposers should make provisions in the proposal budget for transportation and lodging to attend an annual workshop in Washington, DC. The workshop will be held for grantees to present their research work.

C. Deadline/Target Dates

Proposals must be submitted by the following date(s):

Full Proposals by 5:00 p.m. proposer's local time: February 3, 2003

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188 or e-mail fastlane@nsf.gov.

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 certifications within five business days following the electronic submission of the proposal.

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The two 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 he/she 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 and original 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?

NSF staff 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

Proposals for the Electric Power Networks Efficiency and Security (EPNES) will also be reviewed based on:

- Strength and quality of the collaboration plan, and degree of interdisciplinary involvement, and potential impact on education.
- Effectiveness of the management plan and institutional efforts toward supporting and sustaining the interdisciplinary participation in the project.

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 Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Mail Review followed by Panel Review. Panel reviews are jointly administered by program officers from NSF and ONR.

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.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF's goal is to tell applicants whether their proposals have been declined or recommended for funding within six months for 70 percent of proposals. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements 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 its own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division 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.A. for additional information on the review process.)

B. Award Conditions

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 (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions;* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov/>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Research outcomes will be measured via annual reports and in a workshop for Grantees to present their research work. The workshop will be held in the Washington, DC area. Proposers should make provisions in the proposal budget for transportation and lodging to attend the workshop.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, 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.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding NSF/ONR Partnership in Electric Power Networks Efficiency and Security should be made to:

- James A. Momoh, NSF/ENG, Division of Electrical and Communications Systems, e-mail: jmomoh@nsf.gov.
- Rajinder Khosla, NSF/ENG, Division of Electrical and Communications Systems, e-mail: rkhosla@nsf.gov.
- Rahakishan Baheti, NSF/ENG, Division of Electrical and Communications Systems, e-mail: rbaheti@nsf.gov.
- Dan Newlon, NSF/SBE, Division of Social and Economic Sciences, e-mail: dnewlon@nsf.gov.
- Robert O'Connor, NSF/SBE, Division of Social and Economic Sciences, e-mail: roconnor@nsf.gov.
- Nicholas Clesceri, NSF/ENG, Division of Bioengineering and Environmental Sciences, e-mail: nceleseri@nsf.gov.
- Roger Salters, NSF/EHR, Division of Undergraduate Education, e-mail: rsalters@nsf.gov.
- Katherine Drew, ONR/EMPS, Ship Hull, Mechanical and Electrical Systems, e-mail: drewk@onr.navy.mil.

- Spiro Lekoudis, ONR/EMPS, Ship Hull, Mechanical and Electrical Systems, e-mail: lekouds@onr.navy.mil

For questions related to the use of FastLane, contact:

- Gwendolyn Owens, Administrative Officer, ENG/ECS, telephone: (703) 292-8339, e-mail: gowens@nsf.gov.
- Fastlane user support services, telephone: (703) 292-8142, e-mail: fastlane@nsf.gov.

General inquiries on EPNES can be directed to one of the NSF staff named as a contact in the solicitation. For questions related to FastLane, contact the FastLane help line at 1-800-673-7188 or via email to fastlane@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](#), which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](#) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

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, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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; 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 applicant 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 needing information as part of the review process or in order to coordinate programs; 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," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid 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 this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

OMB control number: 3145-0058.