FY 2000/2001 Combined Research-Curriculum Development (CRCD)

Program Announcement

NSF 00-66

DIRECTORATE FOR COMPUTER AND INFORMATION SCIENCE AND ENGINEERING
DIRECTORATE FOR ENGINEERING

LETTER OF INTENT DEADLINE: March 31, 2000 *(Optional)*
DEADLINE: June 2, 2000

NATIONAL SCIENCE FOUNDATION

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 Web Site at:

http://www.nsf.gov

- **Location:**   4201 Wilson Blvd.
                                                                          Arlington, VA 22201.

- **For General Information (NSF Information Center):**   (703) 306-1234

- **TDD (for the hearing-impaired):**   (703) 306-0090

- **To Order Publications or Forms:**

    Send an e-mail to: pubs@nsf.gov

    or telephone: (301) 947-2722

- **To Locate NSF Employees:**   (703) 306-1234

SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: FY 2000/2001 Combined Research-Curriculum Development (CRCD)

Synopsis of Program: The Combined Research-Curriculum Development(CRCD) Program, a joint initiative of the Directorate for Engineering (ENG) and the Directorate for Computer and Information Science and Engineering (CISE), supports multidisciplinary projects that integrate new, state-of-the-art research advances in emerging technology areas into upper level undergraduate and introductory graduate engineering and computer and information science curricula. Projects address a need for innovative curricula, courses, textbooks, instructional modules and instructional laboratories by integrating the research and education interests of faculty through involvement in curriculum change. The CRCD program seeks to closely engage faculty researchers, with support of academic administration and industry, in curriculum innovation in the context that education and research are of equal value and complementary parts of an integrative engineering and science education enterprise.

Cognizant Program Officer:

- Mrs. Mary Poats, CRCD Program Manager (main Program contact), Engineering Education and Centers, 585, telephone: 703-306-1380, e-mail: mpoats@nsf.gov.
- Dr. Sohi Rastegar, Program Director, Bioengineering and Environmental Systems, 565, telephone: 703-306-1320, e-mail: srasteg@nsf.gov.
- Dr. Stefan Thynell, Program Director, Chemical and Transport Systems, 525, telephone: 703-306-1371, e-mail: sthynel@nsf.gov.
- Dr. Kishan Baheti, Program Director, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: rbaheti@nsf.gov.
- Dr. Usha Varshney, Program Director, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: uvarshe@nsf.gov.
- Dr. Jack Scalzi, Program Director, Civil and Mechanical Systems, 545, telephone: 703-306-1360, e-mail: jscalzi@nsf.gov.
- Ms. Cheryl Albus, Program Manager, Design, Manufacture, and Industrial Innovation, 570, telephone: 703-306-1330, e-mail: calbus@nsf.gov.
- Dr. Harry Hedges, Program Director, Experimental and Integrative Activities, 1160, telephone: 703-306-1981, e-mail: hhedges@nsf.gov.
- Dr. Anthony Maddox, Program Director, Experimental and Integrative Activities, 1160, telephone: 703-306-1981, e-mail: amaddox@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number:

- 47.070 --- COMPUTER AND INFORMATION SCIENCE AND ENGINEERING
- 47.041 --- ENGINEERING

ELIGIBILITY INFORMATION

- **Organization Limit:** U.S. academic institutions with undergraduate and/or graduate engineering and/or computer and information science research and education programs may submit proposals in response to this announcement.
- **PI Eligibility Limit:** Please see the full program announcement for further information.
- **Limit on number of Proposals:** An institution may submit no more than three (3) proposals in response to this announcement, as the sole or lead institution, in case of multi-institution proposals.

AWARD INFORMATION

▪ **Anticipated Type of Award:** Standard Grant
▪ **Estimated Number of Awards:** 10-15
▪ **Anticipated Funding Amount:** $6.2 million

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Guidelines
    ▪ **Proposal Preparation Instructions:** Supplemental Preparation Guidelines.
        ▪ The program contains supplements to the standard GPG proposal preparation guidelines. Please see the full program announcement for further information.

B. Budgetary Information

    ▪ **Cost Sharing Requirements:** Cost Sharing is required (Percentage)
    ▪ **Cost Sharing Level/Amount:** 25%
    ▪ **Indirect F&A Costs:** Not Applicable
    ▪ **Other Budgetary Limitations:** Maximum $500,000 award for up to 3 years

C. Deadline/Target Dates

    ▪ **Letter of Intent Deadline:** 3/31/00 *(Optional)*
    ▪ **Preproposal Deadline:** None
    ▪ **Full Proposal Deadline:** 6/2/00

D. FastLane Requirements

    ▪ **FastLane Requirements:** Full Proposal Required
    ▪ **FastLane Contact:**
        ▪ FastLane User Support, telephone: 703-306-1142, e-mail: fastlane@nsf.gov.

PROPOSAL REVIEW INFORMATION

▪ **Merit Review Criteria:** Additional merit review criteria apply. Please see the full program announcement for further information.

AWARD ADMINISTRATION INFORMATION

▪ **Award Conditions:** Standard NSF award conditions apply.
▪ **Additional Reporting Requirements:** Standard NSF reporting requirements apply.

I. INTRODUCTION

Preeminence in science, engineering and technology has been a foundation of our Nation's strength for much of its history. The National Science Foundation (NSF)strives to enable the Nation to uphold a position of world leadership in all aspects of science, mathematics, and engineering by promoting the discovery and use of new knowledge in service to society along with excellence in education at all levels. The Foundation seeks to stimulate the pursuit of excellence through the implementation of its four core strategies: developing intellectual capital, strengthening the physical infrastructure, integrating research and education, and promoting partnerships. It serves as the catalyst for the pursuit of excellence in research and education by U.S. academic institutions and provides leadership and stewardship for institutions engaged in learning and discovery. Now, the increasing pace of technological change presents new challenges which must be addressed by the research and education communities, challenges that can only be met through the effective integration of research and education.

The Combined Research-Curriculum Development (CRCD) Program, a joint initiative of the Directorate for Engineering (ENG) and the Directorate for Computer and Information Science and Engineering (CISE), seeks proposals to implement the four core strategies in providing engineering and computer and information science education that is dynamic, relevant, and connected to the changing needs of industry and society in emerging technology areas.

II. PROGRAM DESCRIPTION

Objectives

The CRCD Program supports multidisciplinary projects that integrate state-of-the-art research advances in emerging technology areas into upper level undergraduate and introductory graduate engineering and computer and information science curricula. Projects address a need for innovative curricula, courses, textbooks, instructional modules and instructional laboratories by integrating the research and education interests of faculty through curriculum change. Thus, NSF through the CRCD program seeks to closely engage faculty researchers, with support of academic administration and industry, in curriculum innovation in the context that education and research are of equal value and complementary parts of an integrative engineering and science education enterprise.

CRCD projects should take leadership, both at the participating institutions and nationally, for developing new models of learning and innovative teaching environments. CRCD projects should incorporate learning theory and cognitive sciences research that promote student-based learning styles; integrate their education and research roles; stress active, collaborative learning with less dependence on lectures; utilize emerging information techologies and network communications; and develop students' capability and motivation to engage in lifelong learning.

Project Areas

Each proposal submitted to the FY 2000/2001 CRCD program competition must focus on a particular topic which is of industrial and national importance in a research area supported by either the Directorate for Engineering (ENG) or the Directorate for Computer and Information Science and Engineering (CISE). The topic area should be one in which the development of educational materials and curricula, based on newly created fundamental engineering and computer and information science knowledge, enhances the education and careers of future engineers and scientists by enabling them to compete in the global environment. In this competition CRCD proposals are encouraged in the following initiative areas emphasized by the ENG and CISE Directorates:

Nanoscale Science and Engineering; Wireless Information Technology and Networks; Biotechnology; ENG Information Technology activities; Information Technology Research; High-Confidence Software Systems; Scalable Information Infrastructures; Human-Computer Interfaces; Advanced Computational Science; Social and Economic Implications of Information Technology; and Learning Science and Technology

For further information on these initiatives please access the ENG Directorate homepage at www.nsf.gov/home/programs/eng.htm and the CISE Directorate homepage at www.nsf.gov/home/cise/start.htm and then click on Information Technology Research.

This special emphasis does not preclude submission or funding of proposals in topic areas other than those listed above.

Project Components

There are four project components within a CRCD project that must be described in detail in the proposal.

Research

Key features of the research component include:
- High-quality, innovative research in emerging technologies, currently underway or recently completed. The research need not have been supported by the NSF but the Principal Investigator(s) must have demonstrated research expertise in the proposed topic area;
- The existence of a sufficient body of research ready and appropriate to be integrated into engineering and/or computer and information science curriculum development and classroom testing; and
- An analysis of the state-of-the-art and practice in the technology area and a rationale for the need for the proposed curriculum development.

Curriculum Development

Key features of the curriculum development component include:
- Analysis of the need for the proposed curriculum innovation in the technology area and the institution(s) curriculum, and rationale for this innovation as related to curriculum development efforts currently underway in the same topic area at the proposing institution(s) or elsewhere;
- Development of innovative upper level undergraduate and/or introductory engineering and/or computer and information science graduate courses(s), a major entrance course of study, and/or course modules for insertion in an ongoing or new course or curricula;
- Rationale for how the proposed innovation will fit into the institution's current engineering and/or computer and information science curricula and the expected impact of the innovation;
- Methodology to incorporate and institutionalize the proposed curriculum innovation into the existing engineering and/or computer and information science curricula;
- Clear articulation of the knowledge, competencies and skills students will have as a result of the curriculum innovation;
- Clear articulation of the goals and objectives of the proposed curriculum, with appropriate metrics identified for project evaluation;
- Emphasis on stimulating critical thinking, intellectual growth and communications skills;
- Innovative education delivery and interactive learning technologies that take full advantage of modern educational and/or research technology and that incorporate research on learning and pedagogy and promote active learning; and
- Inclusion of team-based projects relevant to industrial applications.

Participants

Projects that are multidisciplinary and include faculty from engineering , computer and information science, and other disciplines, as appropiate, are encouraged. Projects must include participation by undergraduate and/or graduate students. It is strongly encouraged that the project team include experts in instructional design/technology and pedagogy.

Multi-institution participation is encouraged in order to both expand the range of expertise in curriculum development and the impact of dissemination. Involvement by persons with expertise in educational methodologies and pedagogy is encouraged for all projects. Because one of the goals of the CRCD program is to prepare engineering and computer and information science students to perform in a rapidly changing, increasingly competitive and global, industrial environment, it is desired that there be substantive, active involvement of industrial participants in these projects throughout the period of the award. Participation by professional society colleagues and national laboratory participants is encouraged where appropriate.

Project Evaluation/Implementation/Dissemination

Projects supported under the CRCD program are inherently innovative and experimental in character. Thus, it is essential that the methodologies and results of each project be subjected to careful evaluation to ensure that the objectives of the project are being met by the resulting innovation. As a minimum please include within the body of the proposal a table with baseline information displayed in columns for each year of the project to show the potential impact of the proposed project. This table should contain the following information: Institution/Department; Course Number/Title/Instructor; Course Level; Number of Students Enrolled Per Offering; Required/Elective; Course Offering Frequency; and Brief Description of the Course Innovation. In order to develop effective measures for evaluation, cooperation with persons experienced in educational assessment and evaluation is strongly encouraged. A major criterion in proposal evaluation will be the strength of the evaluation system proposed. This system must include, as a minimum, measurable objectives (for example, objectives for student learning); procedures to measure their achievement; and a system for monitoring the progress of the project in relation to these measures. Reliable evaluation usually requires multiple measures. NSF resource materials are available to assist institutions in developing and implementing a sound education assessment program, including reports of the Education and Human Resources Directorate, Division of Research, Evaluation, and Communication and engineering education evaluation workshops funded by the Engineering Directorate, Division of Engineering Education and Centers. NSF may work with the proposer(s) during the award process to request the cooperation of individual projects in the collection of specific data via survey or other mechanisms to enable evaluation of the combined effect of its engineering and computer and information science education programs.

To achieve the desired national impact, project results must be evaluated and then disseminated widely within the engineering and computer and information sciene education community once they have been demonstrated effective in accomplishing the projects objectives. The impact of a project depends on the quality and utility of what is learned or produced and upon the breadth and effectiveness of the related dissemination activities. Therefore, the plan for dissemination of project results is a very important component of CRCD projects and should be thought through and articulated carefully in the proposal. A dissemination plan should include designation of the audience to be reached, a description of the information or material to be disseminated, the means of dissemination (such as delivery by electronic means, through workshops, conference presentations, textbooks, laboratory manals, software, audiovisual materials, journal articles, etc.), how these products will be made available to the engineering education and/or computer and information science community and others, the type of assistance available, and procedures and metrics to determine the success of the dissemination effort.

Multiple dissemination approaches are strongly encouraged. If this project involves the development of materials or publications which will be disseminated commercially and in the event that an award is made, the grantee is responsible for developing, documenting and implementing a publication or distribution plan which includes, at the minimum, the following elements:

- Procedures to be followed for selection of a publisher or distributor so as to ensure reasonable competition or justification for non-competitive selection; and
- Delineation of the criteria used in the selection of the publisher or distributor.

It is expected that the institution(s) involved in the CRCD project will provide the leadership needed to ensure that the courses and curriculum developed as a result of the project will be implemented and institutionalized. Therefore, please include in the proposal a milestone chart showing development, pilot studies, implementation, evaluation, dissemination, and completion of deliverables.

III. ELIGIBILITY INFORMATION

U.S. academic institutions with undergraduate and/or graduate engineering and/or computer and information science research and education programs may submit proposals in response to this announcement. An institution may submit no more than three (3) proposals in response to this announcement as the sole or lead institution, in case of multi-institution proposals. Investigators involved in existing NSF-funded research and education projects, including centers and coalitions, are welcome to participate in the program.

IV. AWARD INFORMATION

The projects may total up to $500,000 each with a maximum duration of three (3)years. A proposal involving collaborative or joint arrangements with more than one institution must be submitted by one lead institution only, with the other institution(s) as subawardee(s). If an award is made under the CRCD program, it will be made to the lead submitting institution only.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Proposals submitted in response to this program announcement should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide* (GPG) (NSF 00-2). The complete text of the GPG (including electronic forms) is available electronically on the NSF Web Site at: http://www.nsf.gov/pubs/2000/nsf002/start.htm. 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.

To assist in the selection of reviewers and for other planning purposes, the proposed Principal Investigators(s) should indicate plans to submit a proposal by submitting a one paragraph statement of intent to the Engineering Education and Centers (EEC) Division by March 31, 2000. This statement of intent is optional. This statement should contain the title, technology area of the proposed effort, Principal Investigator(s), institutions(s) and the disciplines involved. Please send this information by any of the following means: by e-mail to mpoats@nsf.gov, by FAX at (703) 306-0290 or -0326, or by letter to Mrs. Mary Poats, ENG/EEC, Room 585, 4201 Wilson Blvd., Arlington, VA 22230.

Letter(s) of institutional and academic department(s)commitment to implementation and institutionalization of the proposed curriculum signed by the Dean of the Engineering College/School or the Dean of Science of the participating institutions are required. (Not part of the proposal page limit). If these signed statements are not included in the Supplementary Documents section of FastLane, then the proposal will be returned to the Principal Investigator without review.

Cost sharing at the level of 25% of the requested total amount of NSF funds is required from all academic institutions participating in the proposal and cost sharing is strongly encouraged from industry or other organizations. A statement, signed by an authorized organizational representative, confirming this commitment must accompany the proposal and if industrial or other organization cost-sharing is included, a signed statement from an authorized industry/other organization offical must also accompany the proposal. (These signed statements are not part of the proposal page limit). If these signed statements are not included in the   Supplementary Documents section of FastLane, then the proposal will be returned to the Principal Investigator without review.

Submit a list of academic participants and list of industrial firms and contacts providing support in this project in the Supplementary
Documents section of FastLane. (This list is not part of the proposal page limit).

Letter(s) from industry regarding the importance of the technology area and its impact on U.S. industrial competitiveness are required as well as the anticipated involvement of the industry in the project. (Not part of the proposal page limit).

Budget (NSF Form 1030). Provide annual budgets showing costs for each of the years requested. FastLane automatically creates the cumulative budget. Please note that the awardees will be expected to participate in an annual, two-day Grantees Conference for the CRCD Program probably in the Washington, D.C. area. Therefore, funds should be budgeted for these meetings. (Not part of the proposal page limit).

If a proposal includes funding for any subawardees, the lead institution's summary and annual budgets should include the total amount for any subawardees in Line G.5., "Subawards." In addition a complete budget (NSF Form 1030) must be submitted for each subaward along with detailed justification signed by that institution's authorized organizational representative for the subaward. (Not part of the proposal page limit).

No videotapes, diskettes, textbooks, or CD-ROMs will be accepted. A proposal that does not adhere to the guidelines set forth above will be returned to the Principal Investigator without review.

Proposers are reminded to identify the program announcement number (NSF 00-66) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Cost Sharing Requirements

Cost sharing at a level of 25% percent of the requested total amount of NSF funds is required for all proposals submitted in response to this announcement. The proposed cost sharing must be shown on line M on the proposal budget (NSF Form 1030).

The amount of cost sharing must be shown in the proposal in enough detail to allow NSF to determine its impact on the proposed project. Documentation of availability of cost sharing must be included in the proposal.

Only items which would be allowable under the applicable cost principles, if charged to the project, may be included in the awardee's contribution to cost sharing. Contributions may be made from any non-Federal source, including non-Federal grants or contracts, and may be cash or in kind (see OMB

Circular A-110, Section 23). It should be noted that contributions counted as cost sharing toward projects of another Federal agency may not be counted towards meeting the specific cost sharing requirements of the NSF grant.

All cost sharing amounts are subject to audit. Failure to provide the level of cost sharing reflected in the approved grant budget may result in termination of the NSF grant, disallowance of grant costs and/or refund of grant funds to NSF.

C. Deadline/Target Dates

For paper submission of proposals, the paper copies of the proposal **MUST** be received by 5:00 PM ET, 6/2/00. [Note: Not applicable to proposals that require full submission via FastLane.]

For electronic submission of proposals, the proposal **MUST** be submitted by 5:00 PM local time, 6/2/00.

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Announcement through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm.

Submission of Signed Cover Sheets. The signed copy of the proposal Cover Sheet (NSF Form 1207) must be postmarked (or contain a legible proof of mailing date assigned by the carrier) within five working days following proposal submission and be forwarded to the following address:

National Science Foundation
DIS – FastLane Cover Sheet
4201 Wilson Blvd.
Arlington, VA 22230

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.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal 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?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration 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 this program are:

- Importance of the technological area and its potential impact on U.S. industrial competitiveness and education;

- Degree of integration of research into curriculum development;

- Innovativeness of the proposed curriculum development effort;

- Potential impact of the project on the education of engineering and/or   computer and information science students and on the overall engineering   and/or computer and information science curriculum;

- Qualifications and demonstrated capabilities of the project team, their understanding of the issues involved in engineering and science education reform and their commitment to the accomplishment of the effort;

- Quality of the plan for project management and operation of the project (particularly necessary when more than one institution is involved);

- Involvement of persons with expertise in educational methodologies, instructional design/technology and pedagogy as appropriate;

- Effectiveness of the proposed project evaluation plan;

- Effectiveness of the proposed project dissemination plan;

- Demonstrated commitment of the institution(s) to implementation and institutionalization of the curriculum; and

- Level of commitment and involvement of industrial sponsors.

[**Note**:While the text of the above Board approved merit review criteria may not be altered, programs can supplement the two approved criteria in this area.]

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are mailed 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 will be reviewed by Panel Review.

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.

NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. 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 NSF brochure, program guide, 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, (NSF 95-26) 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.

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 should be made to the FY 2000/2001 Combined Research-Curriculum DevelopmentProgram:
- Mrs. Mary Poats, CRCD Program Manager (main Program contact), Engineering Education and Centers, 585, telephone: 703-306-1380, e-mail: mpoats@nsf.gov.
- Dr. Sohi Rastegar, Program Director, Bioengineering and Environmental Systems, 565, telephone: 703-306-1320, e-mail: srasteg@nsf.gov.
- Dr. Stefan Thynell, Program Director, Chemical and Transport Systems, 525, telephone: 703-306-1371, e-mail: sthynel@nsf.gov.
- Dr. Kishan Baheti, Program Director, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: rbaheti@nsf.gov.

- Dr. Usha Varshney, Program Director, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: uvarshe@nsf.gov.
- Dr. Jack Scalzi, Program Director, Civil and Mechanical Systems, 545, telephone: 703-306-1360, e-mail: jscalzi@nsf.gov.
- Ms. Cheryl Albus, Program Manager, Design, Manufacture, and Industrial Innovation, 570, telephone: 703-306-1330, e-mail: calbus@nsf.gov.
- Dr. Harry Hedges, Program Director, Experimental and Integrative Activities, 1160, telephone: 703-306-1981, e-mail: hhedges@nsf.gov.
- Dr. Anthony Maddox, Program Director, Experimental and Integrative Activities, 1160, telephone: 703-306-1981, e-mail: amaddox@nsf.gov.

For questions related to the use of FastLane, contact FastLane User Support, telephone: 703-306-1142, e-mail: 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 concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices listed in Appendix A of the GPG. Any changes in NSF's fiscal year programs occurring after press time for the Guide to Programs will be announced in the NSF Bulletin, available monthly (except July and August), and in individual program announcements. The Bulletin is available electronically via the NSF web site at http://www.nsf.gov/home/ebulletin. 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 (FASED) 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 or contact the program coordinator at (703) 306-1636.

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) 306-0090, 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,

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, Information Dissemination Branch, 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.