FY 2002/2003 Combined Research-Curriculum Development (CRCD)

Program Solicitation

NSF 01-139

DIRECTORATE FOR ENGINEERING
DIRECTORATE FOR COMPUTER AND INFORMATION SCIENCE AND ENGINEERING

LETTER OF INTENT DUE DATE(S) (*optional*): August 31, 2001

FULL PROPOSAL DEADLINE(S): October 31, 2001

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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: FY 2002/2003 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(s):

- Mrs. Mary Poats, CRCD Program Manager (main Program contact), Engineering Education and Centers, Room 585, telephone: 703-292-5357, e-mail: mpoats@nsf.gov.
- Dr. Bruce Hamilton, Division Director, Bioengineering and Environmental Systems, Room 565, telephone: 703-292-7066, e-mail: bhamilto@nsf.gov.
- Dr. Thomas Chapman, Program Director, Chemical and Transport Systems, Room 525, telephone: 703-292-8371, e-mail: tchapman@nsf.gov.
- Dr. Kishan Baheti, Program Director, Electrical and Communications Systems, Room 675, telephone: 703-292-8339, e-mail: rbaheti@nsf.gov.
- Dr. Usha Varshney, Program Director, Electrical and Communications Systems, Room 675, telephone: 703-292-8339, e-mail: uvarshe@nsf.gov.
- Dr. Richard Fragaszy, rfragazy@nsf.gov, Program Director, Civil and Mechanical Systems, Room 545, telephone: 703-292-8360.
- Dr. George Hazelrigg, Program Director, Design, Manufacture, and Industrial Innovation, Room 570, telephone: 703-292-7068, e-mail: ghazelri@nsf.gov.
- Dr. Anita LaSalle, Program Director, Experimental and Integrative Activities, Room

1160, telephone: 703-292-4769, e-mail: alasalle@nsf.gov.

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

- 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 solicitation.
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard Grant
- **Estimated Number of Awards:** 16-20
- **Anticipated Funding Amount:** $8 million

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is optional. Please see the full program announcement/solicitation for further information.
- **Preliminary Proposals:** Submission of Preliminary Proposals is optional. Please see the full program announcement/solicitation for further information.
- **Full Proposals:** Supplemental Preparation Guidelines
    - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is required (Percentage).
- **Cost Sharing Level/Amount:** 25
- **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*):** August 31, 2001
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):** October 31, 2001

D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**
    - Esther Bolding, Management Analyst, ENG/EEC, Division of Engineering Education and Centers, Room 585, telephone: 703-292-5342, e-mail: ebolding@nsf.gov.
    - FastLane User Support, IRM/DIS, Division of Information Systems, telephone: 703-292-5342, 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:** 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.

NSF employs the following three core strategies that guide the entire agency in establishing priorities, identifying opportunities, and designing new programs and activities:

1. Develop Intellectual Capital;
2. Integrate Research and Education; and
3. Promote Partnerships.

In pursuit of its historic mission the NSF invests in *people* to develop a diverse, internationally competitive and globally-engaged workforce of engineers, scientists, and well-prepared citizens; in *ideas* to provide a deep and broad fundamental science and engineering knowledge base; and *tools* to provide widely accessible, state-of-the-art science and engineering infrastructure.

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 three 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;
- 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;
- engage faculty researchers 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;
- provide national leadership for developing new models of learning and innovative teaching environments;

- incorporate learning theory and cognitive sciences research that promotes student-based learning styles and integrate their education and research roles;
- stress active, collaborative learning with less dependence on lectures;
- utilize emerging information techologies and network communications;
- develop students' capability and motivation to engage in lifelong learning; and
- prepare engineering and computer and information science students to perform in a rapidly changing, increasingly competitive and global, industrial environment.

Project Areas

Proposals submitted to the FY 2002/2003 CRCD Program Solicitation 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. In this competition CRCD proposals are encouraged in the following areas:

- Nanoscale Science and Engineering
- Optical and Wireless Communications and Networking Technologies
- 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;
- Learning Science and Technology
- Environmental Sensing and Imaging Technologies

This special emphasis does not preclude submission or funding of proposals in topic areas other than those listed above. For further information on current initiatives please access the ENG Directorate homepage at www.eng.nsf.gov and the CISE Directorate homepage at www.cise.nsf.gov and then click on Information Technology Research.

Project Components

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

1. 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.

2. 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 that incorporates research on learning and pedagory and promote active learning; and
- Inclusion of team-based projects relevant to industrial applications.

3. 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;
- involvement by persons with expertise in educational methodologies and pedagogy;

It is strongly encouraged that projects include:

- team experts in instructional design/technology and pedagogy;
- multi-institution participation in order to both expand the range of expertise in curriculum development and the impact of dissemination;
- active involvement of industrial participants in these projects throughout the period of the award; and
- participation by professional society colleagues and national laboratory participants where appropriate.

4. Project Evaluation/Implementation/Dissemination

Evaluation. 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;
- effective measures for evaluation are considered in cooperation with persons experienced in educational assessment and evaluation;
- the evaluation system include:

    - measurable objectives (for example, objectives for student learning);
    - procedures to measure their achievement;
    - a system for monitoring the progress of the project in relation to these measures.
- reliable evaluation usually requires multiple measures.

NSF resource materials and reports are available to assist institutions in developing and implementing a sound education assessment program. 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.

Implementation and Dissemination. To achieve the desired national impact, the project must:

- provide for wide dissemination within the engineering and computer and information science education community;
- demonstrate the accomplishment of the projects objectives;
- impact the quality and utility of what is learned or produced and upon the breadth and effectiveness of the related dissemination activities;
- plan for the dissemination of project. 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 manuals, 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, proposals should include milestones showing development, pilot studies, implementation, evaluation, dissemination, and completion of deliverables.

III. ELIGIBILITY INFORMATION

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. A statement, signed by an authorized organizational representative, confirming this commitment must 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 not be considered for an award.

IV. AWARD INFORMATION

The projects may total up to $500,000 each for 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

Letters of Intent:

To assist in the selection of reviewers and for other planning purposes, it would be helpful to the CRCD program if the proposed Principal Investigators(s) would indicate plans to submit a proposal by submitting a one paragraph statement of intent to the Engineering Education and Centers (EEC) Division. The Statement of Intent due date is listed on the front of this solicitation. 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) 292-9052, or by letter to Mrs. Mary Poats, ENG/EEC, Room 585, 4201 Wilson Blvd., Arlington, VA 22230.

Preliminary Proposals:

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.

Fastlane proposal submissions must include the following:

- Include a table within the body of the proposal that displays baseline information for each year of the project to show the potential impact of the proposed project. This table will contain this information:
    - Institution/Department
    - Course Number/Title/Instructor
    - Course Level
    - Number of Students Enrolled Per Offering
    - Required/Elective
    - Course Offering Frequency
    - Brief Description of the Course Innovation.
- Include the following in the Supplementary Documents section of Fastlane (these items are not part of the proposal page limit):
    - A list of academic participants and list of industrial firms and contacts providing support in this project.
    - 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.
    - 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.
- Provide annual budgets showing costs for each of the years requested. FastLane automaticallycreates 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 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 solicitation number (NSF 01-139) 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. Budgetary Information

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 solicitation. The proposed cost sharing must be shown on Line M on the proposal budget. Documentation of the 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 award. All cost sharing amounts are subject to audit. Failure to provide the level of cost sharing reflected in the approved award budget may result in termination of the NSF award, disallowance of award costs and/or refund of award funds to NSF.

Other Budgetary Limitations: Maximum $500,000 award for up to 3 years

C. Deadline/Target Dates

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

Letters of Intent (*optional*): August 31, 2001
Full Proposals *by 5:00 PM local time*: October 31, 2001

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 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 working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane website at: http://www.fastlane.nsf.gov.

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

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.

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 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 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 is striving to be able 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.

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 FY 2002/2003 Combined Research-Curriculum Development should be made to:

- Mrs. Mary Poats, CRCD Program Manager (main Program contact), Engineering Education and Centers, Room 585, telephone: 703-292-5357, e-mail: mpoats@nsf.gov.

- Dr. Bruce Hamilton, Division Director, Bioengineering and Environmental

Systems, Room 565, telephone: 703-292-7066, e-mail: bhamilto@nsf.gov.

- Dr. Thomas Chapman, Program Director, Chemical and Transport Systems, Room 525, telephone: 703-292-8371, e-mail: tchapman@nsf.gov.

- Dr. Kishan Baheti, Program Director, Electrical and Communications Systems, Room 675, telephone: 703-292-8339, e-mail: rbaheti@nsf.gov.

- Dr. Usha Varshney, Program Director, Electrical and Communications Systems, Room 675, telephone: 703-292-8339, e-mail: uvarshe@nsf.gov.

- Dr. Richard Fragaszy, rfragazy@nsf.gov, Program Director, Civil and Mechanical Systems, Room 545, telephone: 703-292-8360.

- Dr. George Hazelrigg, Program Director, Design, Manufacture, and Industrial Innovation, Room 570, telephone: 703-292-7068, e-mail: ghazelri@nsf.gov.

- Dr. Anita LaSalle, Program Director, Experimental and Integrative Activities, Room 1160, telephone: 703-292-4769, e-mail: alasalle@nsf.gov.

For questions related to the use of FastLane, contact:

- Esther Bolding, Management Analyst, ENG/EEC, Division of Engineering Education and Centers, Room 585, telephone: 703-292-5342, e-mail: ebolding@nsf.gov.

- FastLane User Support, IRM/DIS, Division of Information Systems, telephone: 703-292-5342, 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 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 (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/solicitation for further information.

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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.

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