IV. OTHER REPORTING REQUIREMENTS

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Debt Collection Improvement Act of 1996
Net Accounts Receivable totaled $755,789 at September 30, 2002. Of that amount, $184,572 was receivable from other federal agencies. The remaining $571,217 was receivable from the public. NSF fully participates in the Department of the Treasury Cross-Servicing Program. In accordance with the Debt Collection Improvement Act, this program allows NSF to refer debts that are delinquent more than 180 days to the Department of the Treasury for appropriate action to collect those accounts. Additionally, NSF seeks Department of Justice concurrence for action on items over $100,000.

Civil Monetary Penalty Act
There were no Civil Monetary Penalties assessed by NSF during the relevant financial statement reporting period.

Prompt Payment Act
NSF continues to strive for the highest levels of electronic fund transfers (EFT) payments required by the Prompt Payment Act. Payroll, vendor and grantee payment transactions are made by EFT. Only payments made to foreign banks were made by paper check. Our FastLane system utilized for grants enables the grantees to draw cash as required for execution of the grant. Interest payments for commercial vendors under the Prompt Payment Act in FY 2002 were minimal.
NSF is proactive in building strong internal controls over our payment process. Consequently, erroneous payments made in FY 2002 were minimal.

Cash Management Improvement Act
In FY 2002, NSF had only one Treasury-State Agreement covered under the Act. NSF's FastLane system with grantee draws of cash make the timeliness of payments issue under the Act essentially not applicable to the agency. No interest payments were made in FY 2002.

Patents and Inventions Resulting From NSF Support
The following information about inventions is being reported in compliance with Section 3(f) of the National Science Foundation Act of 1950, as amended [42 U.S.C. 1862(f)]. In FY 2002, the Foundation received 880 invention disclosures. Rights to these inventions were allocated in accordance with Chapter 18 of Title 35 of the United States Code, commonly called the "Bayh-Dole Act."

Inspector General's Memorandum on Management Challenges and the Director's Response
As required by the Reports Consolidation Act of 2000, the following is the Inspector General's memorandum addressing NSF's management challenges in 2003. It is followed by the Director's response.

December 23, 2002

MEMORANDUM

To: Dr. Warren Washington
                Chair, National Science Board

                Dr. Rita R. Colwell
                Director, National Science Foundation

From: Dr. Christine C. Boesz
                Inspector General, National Science Foundation

Subject: Management Challenges for NSF in 2003

As required by 31 U.S.C. § 3516(d), I am pleased to submit our annual statement summarizing what the Office of Inspector General (OIG) considers to be the most serious management and performance challenges facing the National Science Foundation (NSF). The purpose of the management challenges list is to focus attention on work that *needs to be done*, rather than on good work that has *already* been done. So at the outset, allow me to commend the dedicated and hard-working staff of NSF on their accomplishments of the past year.

While I continue to believe that NSF is one of the most cost-effective federal agencies, the challenges that the OIG has identified include some difficult issues that NSF will need to address in the near future. Based on my discussions with NSF managers, I have every confidence that they understand the importance of these challenges and are taking proactive measures to address them. As in the past, we look forward to working closely with NSF staff and leadership.

While we are encouraged by the progress that has been made on some of the challenges from last year's list, the corrective actions have not yet advanced to the point where NSF can afford to become complacent. The 11 specific challenges which the OIG has identified through audits and general knowledge of NSF's operations fall into five general categories, the first four of which are linked to the President's Management Agenda: 1) strategic management of human capital; 2) improved financial performance; 3) expanded electronic government; 4) budget and performance integration; and 5) program-specific challenges.

1. Strategic Management of Human Capital

Workforce Planning and Training
Planning for NSF's future workforce needs and training the large number of temporary staff continue to be serious concerns. In April 2002 we responded to a congressional request for information by reporting that NSF does not currently have a comprehensive workforce plan, but is contracting for a multi-year "business analysis" of its operations that will include a human capital management plan identifying its future workforce requirements. The contractor has completed its initial review of the current workforce and is scheduled to deliver a complete human capital management plan in 2004. Its efforts to establish a baseline may have been complicated by the uneven quality of some of NSF's past personnel records. Reliable personnel data is essential to a serious workforce planning initiative.

Thus far, the contractor has reported that 40% of NSF's permanent workforce is currently eligible for either voluntary retirement or early out, and that number will grow to nearly 60% by 2007. Eligibility for retirement will most keenly affect science and engineering staff and supervisors, suggesting that more attention to succession planning by the agency is needed. Personnel records also indicate that since 1996, NSF's reliance on temporary staff has increased in tandem with the size of its appropriation. According to the contractor's report, the 14% reduction in NSF's permanent workforce has been more than offset by temporary hires. The increase in temporary staff places a greater burden on the agency, particularly Human Resource Management, to continually recruit and train these personnel and find them suitable office space.

The agency established the NSF Academy, an in-house training service, in 2002 in part to address succession planning issues related to the aging of its permanent workforce and the agency's increasing reliance on temporary personnel. NSF is currently recruiting both an advisory committee and a dean to manage the training challenges that lie ahead.

Budget for Administration and Management
It is increasingly apparent that NSF's staff is in need of two basic resources to do its job: office space and travel funds. This year's management certification of the agency's internal controls contains multiple cautionary statements from senior managers about these two issues and their impact on operations.

Assistant Directors are reporting that program managers are being forced to double up in offices or use cubicles that are inadequate for them to perform their work. Some are even working out of office space originally intended for use as closets. NSF has been slow to pursue potential remedies such as leasing additional space in an adjoining building or encouraging wider use of telecommuting to alleviate the current overcrowding. If office space is inadequate at current workforce levels, it will severely constrain the agency's ability to add the staff needed to grow at the rate intended by the NSF Authorization Bill (HR 4664). We therefore believe that the agency cannot afford to wait for the results of its Business Analysis, which is not expected to conclude until 2006, to begin planning for and acquiring new offices.

The shortage of travel funds affects NSF's ability to successfully address several of the management challenges identified here. Funds are needed to conduct on-site inspections and properly oversee large infrastructure projects and other awards. The lack of money also diminishes NSF's ability to travel to recruit temporary scientific and engineering staff known as "rotators" and to conduct educational activities for the science community. NSF should seek to maximize the effectiveness of staff by allocating more funding for these two essential resources.

2. Improved Financial Performance

Management of Large Infrastructure Projects
The effective management of NSF's large infrastructure projects has been a concern of the OIG for several years. In particular, fund control and the accurate accounting for infrastructure projects have been cited as a problem in recent audit reports. At the request of a Senate Appropriations Subcommittee, we performed an audit this past year of the funding for major research equipment and facilities. Our objective was to determine if NSF used its Major Research Equipment and Facilities Construction (MREFC) appropriation solely to fund the

construction and acquisition costs for these projects as required. We found that NSF's past policies and procedures allowed the agency to use multiple appropriation accounts to fund acquisition and construction costs, and that NSF's accounting for these projects only captured costs that were funded from the MREFC account. As a result, NSF could not ensure that it stayed within its authorized funding limits or that it provided accurate and complete information about project costs to key decision makers.

Since the release of the audit report, NSF has made progress toward correcting the types of problems identified. Responding to OIG recommendations pending since May 2000, the agency recently issued its current draft of the Facilities Management and Oversight Guide and instructed staff to begin using it. The Guide is intended to help prevent problems related to fund control and better assure that projects are completed on time and on budget. The agency states that it will continue to make needed improvements to the Guide over time. NSF also appointed an Interim Deputy Director of Large Facility Projects, a newly created position that will oversee the development of large facilities projects, and is continuing to recruit a permanent Deputy Director.

Award Administration
NSF expends approximately 90% of its appropriated funds on grants in any given year. Although the agency has a robust system of award management over its pre-award and award disbursement activities, NSF lacks a comprehensive, risk-based management program to monitor its grants during the post-award phase. NSF's post-award management will appear once again as a reportable condition in our FY 2002 Management Letter Report. NSF should establish policies to ensure that awardees are complying with the requirements of their grant agreements, including 1) implementing a comprehensive risk-based program that describes when and how monitoring will occur; and 2) establishing a system of risk assessment of awardees to ensure that each receives the appropriate level of oversight.

NSF recently issued a draft version of a Risk Assessment and Award Monitoring Guide and has been working closely with OIG to address this challenge. The Guide is generally responsive to the recommendations outlined in the FY 2001 Management Letter Report and represents an important first step to improving NSF's post-award administration practices. However, more detail will be needed before the Guide can serve as an effective reference covering the full range of issues that are likely to face many grant and program officers. For example, it does not provide guidance for the oversight of awardees that are considered less than high risk. To assist NSF in this effort, OIG is currently working on a best practices assessment that will highlight some valuable ideas about post-award administration from several grant-making organizations, both private and public.

Cost Sharing
Cost sharing leverages the government's investment in basic research by obtaining commitments from grantees and others to pay part of the expense. In FY 2001, NSF made 3,346 awards that required cost sharing amounting to $534 million. OIG recently completed two audit initiatives focused on cost-sharing, one at five campuses of a western university and the other at eight geographically diverse institutions throughout the United States.

Our audit work indicates that NSF grantees continue to experience significant problems in accounting for cost sharing, raising questions about whether required contributions are actually

being made. The issues cited in our reports are primarily related to the commingling of reimbursable and cost-shared expenses, time and effort reporting, and cost-sharing certification. Acting on a recommendation by NSF, the National Science Board recently modified NSF's policies to discourage program officers from asking proposers for amounts of cost sharing above the statutory requirement when there was a tangible benefit to the awardee. While the new policy may help limit the amount of cost sharing borne by awardees, problems with how it is accounted for remain.

3. Expanded Electronic Government

Data Security
As is the case with most modern enterprises, NSF's operations are highly dependent on information systems such as FastLane, Financial Accounting System (FAS) and Enterprise Information System (EIS) to conduct business. The challenge for management is to implement security controls to protect these and other key information systems against unauthorized access and misuse, while maintaining the open and collaborative working environment needed to achieve NSF's mission. Although NSF has made significant progress in strengthening data security in recent years, more improvements are needed. Our FY 2002 review of NSF's information security program identified three significant deficiencies related to weaknesses in access controls, the security management structure, and the certification and accreditation of major systems. Although NSF management disagreed with our assessment of the severity of these problems, it agreed with our recommendations and is taking action to correct the problems.

The agency is to be commended for the improvements in its security program made in the past year, including implementation of a mandatory security awareness training program, formal assignment of security responsibilities and authorities, restructuring of key security positions, appointment of an agency-wide security officer, and establishment of updated security policies and procedures. These accomplishments help build a foundation for a comprehensive security program and demonstrate the agency's commitment to information security. However, as would-be hackers and thieves adopt more inventive methods for penetrating a system, a good information security program must adapt to rapidly changing threats. It must be flexible, capable of continuous improvement, and supported at all organizational levels to ensure that future attacks are thwarted.

4. Budget and Performance Integration

GPRA Data Quality
We continue to have concerns about the validity and quality of NSF's Government Performance and Results Act (GPRA) data and outcome measures. In order to achieve the performance-oriented government envisioned in the President's Management Agenda, the Office of Management and Budget (OMB) has directed agencies to align program activities with outputs and outcomes and be prepared to conduct a more rigorous analysis of program effectiveness by FY 2004. However, two studies commissioned by NSF raise questions about the progress made by the agency toward meeting these goals.

According to an August 2002 report on performance, budget, and cost integration prepared by an outside consultant, NSF Division Directors (DDs) have been critical of the large number of annual GPRA performance goals presented by NSF and suggested they be prioritized. The

report stated that "DDs are uncertain which performance goals are the most important to NSF. DDs also questioned the value of the GPRA measures and mentioned that they do not use them to develop their budgets. This would indicate a need for greater program involvement during goal and measure development." A majority of DDs surveyed also indicated that performance information captured by NSF institutionally was inadequate and had to be supplemented through the efforts of their respective staffs. If performance measures are not relevant to either the preparation of budgets or management of a program, an important purpose for compiling GPRA information has been overlooked.

In a report by an advisory committee on GPRA, a group of scientists was asked to review examples of accomplishments from recently completed awards to determine whether NSF was successful in achieving its GPRA outcome goals. While the group found that the accomplishments selected by the agency demonstrated significant achievement, they questioned how the accomplishments were chosen and recommended that NSF revisit its sampling methodology. Asked to comment on the effectiveness of NSF's external planning and prioritization activities, the group said that the evidence presented by NSF did not make clear how the planning activities influenced or were incorporated into NSF's internal priority-setting process, echoing some of the comments in the consultant's report.

Cost Accounting Systems
Managerial (cost) accounting information is used to assess operational effectiveness and efficiency. Cost information not only adds significant value to activities such as budgeting, cost control, and performance measurement, but also is useful in informing capital investment decisions such as prioritizing the funding of large infrastructure projects. In the OIG's FY 2001 Management Letter Report, our auditors found that NSF had not developed a cost accounting system adequate for its management information needs. For example, NSF's systems do not track cost data either by infrastructure project or by strategic outcome goal. To obtain a full accounting for these projects or outcomes, NSF currently must perform additional processing, some of it manual, that increases the risk of errors and reduces its usefulness to decision makers. NSF should use its accounting systems to capture total project or outcome costs and supply information useful to the Congress, OMB, the National Science Board and NSF management.

NSF recently contracted with a consulting company to study ways it could improve its integration of performance, cost and budget information. The contractor identified a number of areas in which NSF could make basic improvements, many of which are consistent with the recommendations made in our Management Letter Report. The consultant also reported that division directors expressed the need for basic cost performance data, such as the cost to process and review proposals, to monitor program performance, and to inform the public about NSF-funded research. The consultant issued a report in August 2002 identifying options for establishing additional cost accounting and performance measurement capabilities to satisfy the immediate operational and long-term needs of NSF. As a result, NSF developed a draft action plan to achieve better alignment between resources and goals of the agency. Once OMB approves the final plan of action, NSF has indicated it will begin implementation.

5. NSF Program-Specific Challenges

Management of U.S. Antarctic Program
The successful operation of the U.S. Antarctic Program (USAP) requires diverse and unique administrative skills combined with knowledge of the special needs of Antarctic researchers. NSF's Office of Polar Programs (OPP) oversees the USAP, manages all U.S. activities in the Antarctic serving the scientific community, and funds a significant share of NSF's polar research. OPP is comprised of two science sections that specialize in Arctic and Antarctic research respectively, and a third section that provides laboratory, operational, and logistics support to the community. Its modest support staff of 17 employees is leveraged through a contract with private companies and agreements with governmental organizations to administer its many activities. During the 2001-2002 austral summer, 2,000 civilian contract employees and military personnel were engaged in support of more than 800 researchers conducting 148 scientific projects.

Our audit work continues to focus on Antarctic support activities because of their many inherent risks. One issue that has been raised in Committee of Visitors (COV) reports, as well as our audit work, is the need to improve long-range capital planning and budgeting for repairing and maintaining the Antarctic infrastructure, including facilities, transportation, and communications. As a recent COV report noted, most facilities and equipment have been extended well beyond their useful lives. Old buildings and equipment present increased operational risks, and in some cases, may pose safety and health concerns. Another important element of OPP's plan to improve infrastructure is the need to acquire specially modified tractors and equipment for support of more overland science traverses. Such traverses are not only useful in conducting research projects, but could deliver fuel and other supplies to South Pole Station and other research locations, freeing LC-130 aircraft to perform other missions.

Broadening Participation in the Merit Review Process
Increasing the participation of minority scientists as proposers, reviewers, and investigators, while maintaining the integrity of the award process, remains an important priority and challenge for NSF. For example, the agency reported that the number of awards to minority Principal Investigators (PIs) increased by 9% in FY 2001, while the proposals received increased by 17%. The National Academy of Public Administration last year recommended establishing broader-based review panels with participants drawn from a wider range of institutions, disciplines, and underrepresented minorities. However, NSF's efforts to track the demographics of the reviewer population for the purpose of establishing a related GPRA goal have been hampered by the desire of many reviewers not to disclose their race or ethnicity.

NSF's Advisory Committee on GPRA noted progress in improving minority participation in the process, but it also pointed out that proposals from the group still represent a small fraction of the total number NSF receives. The report states: "NSF should consider carefully the demographic changes that are anticipated in the academic research community. The agency should develop and implement strategies to ensure as much as possible that its processes incorporate broad representation of the full demographic range of the future research community." We agree with the Committee that NSF's success in broadening participation in the merit review process will help determine its future effectiveness.

<u>Math and Science Partnership</u>
As the performance of American school children on math and science tests has lagged behind other countries, NSF was designated in 2001 as the lead agency on a key element of the President's initiative, *No Child Left Behind,* aimed at strengthening and reforming K-12 math and science education. The partnerships differ from most other education programs by attempting to expand the involvement of higher education in reforming K-12 math and science education. This past year, NSF announced its first 24 awards under the new program, and it is expected to provide approximately $240 million in funding over five years. $147 million has been given for *comprehensive* awards designed to improve student achievement at all grade levels, and $90 million has gone to *targeted* partnership grants that focus on specific disciplines or grade ranges.

The sustained involvement of NSF remains essential. NSF program officers now need to provide extensive coaching of the new projects to ensure that awardees do effective project planning. Because the success of the program depends on a sustained collaboration between institutions that may not be used to working together, NSF staff will also need to assist project partners in building a shared sense of purpose and in coordinating efforts. Also, those projects involving awardees with limited experience in handling federal funds will require close monitoring of all aspects of their projects, including financial and administrative matters. Therefore, NSF staff will need to help coordinate the efforts of the various parties, monitor the progress of the projects, and ensure that federal funds are handled properly, while at the same time administering the subsequent program solicitation of approximately $200 million.

In closing, I am pleased to report that NSF continues to improve its operations as it responds to the above challenges. If you have any questions regarding these challenges, please contact me at your convenience.

NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

NSF

**OFFICE OF THE
DIRECTOR**

MEMORANDUM

DATE: January 24, 2003

FROM: Director

SUBJECT: Response to the Inspector General's Statement of the National
                   Science Foundation's Most Serious Management and Performance
                   Challenges

TO: Dr. Christine C. Boesz
                   Inspector General

Thank you for your memorandum dated December 23, 2002 on the National Science Foundation's performance and management challenges as authorized by the Reports Consolidation Act of 2000.

We are pleased with your continued recognition that the Foundation is one of the most cost-effective agencies in the federal government. This is reflected in the "green light" we received from OMB on the President's management scorecard for our financial management system and the additional green light in 2002 for electronic government. In addition, external panels have found our programs to be "of high quality and efficiently managed." We can all take pride in these accomplishments.

Nonetheless, we recognize that there is more we can do. We are challenged in an ever-increasing complex world situation to insure that we maintain our high standards and focus on our efficiency and effectiveness. Over its 50-plus year history, NSF's commitment to excellence in supporting research and education has consistently been matched by its high standards and commitment to innovation in administration and management. Continuing this tradition of excellent stewardship requires new approaches and new investments that reflect NSF's increasing responsibilities, the growing complexity of its workload, and stringent requirements for both IT and physical security, as discussed in NSF's FY 2004 Budget Request.

The five broad areas of management and performance challenges that you have identified are consistent, in many respects, with those identified by NSF's senior

management as areas that require our constant attention to assure improvement of our long-term operating performance. Furthermore, four of these areas are directly connected to the President's Management Agenda: Strategic Management of Human Capital; Improved Financial Performance; Expanded Electronic Government; Budget Performance and Integration. The NSF Program-Specific Challenges are likewise consistent with areas that we recognize as requiring increased attention.

We have continued to actively address these challenges. Steps taken in FY2002 include:

- the development and promulgation of a formal NSF Administration and Management Strategic plan, serving as a blueprint for addressing critical challenges and key components of the President's Management Agenda;
- laying the groundwork for incorporating the A & M plan into the next iteration of the NSF strategic plan;
- the development of the scope of work and the competitive award of a Business Analysis contract to provide support and added analytic capacity in the execution of the A & M Strategic Plan;
- the creation and inauguration of an external advisory committee for GPRA Performance Assessment;
- the formal Chartering of the NSF Academy;
- the development of and submission to OMB of a grants oversight *Risk Assessment and Award Monitoring Guide* to support a risk-based, strategic approach to award oversight;
- the issuance of a working *Large Facility Projects Management Oversight Plan;*
- active staff involvement and commitment to government-wide e-Government initiatives, including e-Grants, e-Travel and e-Payroll initiatives; and
- the issuance of a revised agency wide security policy, with emphasis on critical computer security issues.

Thus, we continue to take solid strategic steps to address the challenges before us. All of these accomplishments are the result of countless staff hours for activities that go beyond the scope of our high volume daily operations. As you point out, the plan to address these challenges must include access to additional agency resources to keep pace with our increasing workload.

I am pleased that you recognize the great strides that NSF has taken over the past year to improve our operations in response to these challenges. Your office's support and analysis were helpful to our successfully making the case to OMB for increased staffing and resources for A&M in the FY 2004 Request and your comments this year are similarly useful. In this spirit, we look forward to continuing to work together to improve the efficiency and effectiveness of the operations of the Foundation.

Rita R. Colwell