

**MEMORANDUM TO NATIONAL SCIENCE BOARD MEMBERS AND
CONSULTANTS**

SUBJECT: Summary Report of May 3-4, 2004 Meeting

The major actions of the National Science Board (NSB, the Board) at its 380th meeting on May 3-4, 2004 are summarized for the information of those Members absent and as a reminder to those present. In addition, a preliminary summary of the proceedings is provided.

This memorandum will be made publicly available for any other interested parties to review. A more comprehensive set of NSB meeting minutes will be posted on the Board's public Web site following Board approval at its next meeting.

1. Major Actions of the Board (not in rank order of importance)

- a. The Board approved the minutes for the Open Plenary Session (http://www.nsf.gov/nsb/meetings/mtg_list.htm#recent) and Closed Plenary Session of the March 2004 meeting of the NSB.
- b. The Board approved a resolution to close portions of the upcoming August 4-5, 2004 NSB meeting dealing with staff appointments, future budgets, pending proposals/awards for specific grants, contracts, or other arrangements, and those portions dealing with specific Office of the Inspector General (OIG) investigations and enforcement actions, or agency audit guidelines (NSB-04-49) (Attachment 1).
- c. Dr. Warren M. Washington was re-elected to a two-year term as Chairman of the Board, and Dr. Diana S. Natalicio was re-elected to a two-year term as Vice Chair. Drs. Washington and Natalicio were elected by acclamation to two-year terms as members of the Executive Committee.
- d. The Board approved a new priority order for existing new start Major Research Equipment and Facilities Construction (MREFC) Projects, in the following order: Scientific Ocean Drilling Vessel, National Ecological Observatories Network, Rare Symmetry Violating Processes, Ocean Observatories Initiative, and Alaska Region Research Vessel.
- e. The Board approved the transmittal letter and management response to the OIG Semi-Annual Report.

- f. The Board authorized the Acting Director, at his discretion, to make an award to Network for Earthquake Engineering Simulation (NEES) Consortium, Inc., for NEES Consortium operations during FY 2005-2014.
- g. The Board authorized the Acting Director, at his discretion, to extend the current Cooperative Agreement with Florida State University for the support of the National High Magnetic Field Laboratory.
- h. The Board authorized the Acting Director, at his discretion, to negotiate a Cooperative Agreement with the University of Wisconsin for construction of the IceCube Neutrino Observatory.
- i. The Board approved the annual report of the NSB Executive Committee, as presented by the Chairman, Dr. Arden L. Bement, Jr., National Science Foundation (NSF, the Foundation) Acting Director (NSB/EC-04-6) (Attachment 2).
- j. The Board approved a schedule of meetings for 2005 (NSB-04-75) (Attachment 3).
- k. The Board was notified that the NSB Chairman had received a request from a U.S. Senator that no further steps should be taken to implement the Board's recent policy change regarding eligibility of Smithsonian Institution (SI) researchers to apply for NSF grants. After further consultation with Board Members, congressional staff and the Office of Science and Technology Policy (OSTP), the NSB Chairman agreed that the NSF Acting Director would stop his negotiations with SI on a memorandum of understanding to implement the policy change. The Chairman has notified the Senator that the Board will not take any further action toward implementing such a policy change until OSTP has completed its government-wide review of Federal researchers who compete for other Federal funds, and consensus for implementing the Board's SI resolution has been reached by Congress (See Attachment 4).
- l. The Board unanimously approved a new process for developing, reviewing, approving, and prioritizing large-scale research facility projects. The Board-approved document describing this process (Attachment 5) provides an overarching, cross-disciplinary context and addresses recommendations from a recent National Research Council report, as well as concerns expressed by Congress. The specific details for implementing this new process will be developed jointly by the Board and the Foundation in the coming months, and will be reviewed and approved by the Board prior to full implementation.
- m. The Chairman discharged with thanks the *ad hoc* Committee on the 2004 Vannevar Bush Award, Chaired by Dr. Bowen, with Members Drs. Beering, Fedoroff, Hastings, and Savitz.

2. NSB Chair's Report

The Chairman recognized and thanked the NSB Class of 2002, who were completing their service with the May Board meeting: Drs. Steven Beering, Anita Jones, George Langford, Joseph Miller, Robert Richardson, Maxine Savitz, and Luis Sequeira.

On behalf of the Board, he thanked them for their dedication, hard work, and, especially, for their willingness to struggle with the complex policy issues that the Board has addressed during their term. Their service on behalf of the science and engineering enterprise and the Nation has been exemplary and much appreciated.

He announced that the eighth member of the Class of 2002, Dr. Pamela Ferguson, passed away on April 24 after a long illness. Despite her illness, the Chairman said she served the Board well with her insight and expertise. He asked for a moment of silence in her honor.

With the Board's approval of a meeting schedule for 2005, the Chairman asked the Executive Officer to develop a short list of candidate locations for the 2005 annual retreat and visit to an NSF-supported facility, and to present the list at the August 2004 NSB meeting.

The Chairman announced with pleasure that Dr. Jane Lubchenco has been awarded the American Institute of Biological Sciences' Distinguished Scientist Award and offered her the congratulations of the Board.

The Chairman described the annual Awards Dinner held May 3 at the National Museum for Women in the Arts, and said it is one of the few opportunities the Board has to recognize the distinguished contributions of individuals and organizations to the advancement of science, and recalled that the Board was honored to receive a gracious message from the President. He said it was an honor and a privilege to present the 2004 Honorary Awards to such distinguished, talented, and creative people as Dr. Mary L. Good, Dean of the College of Information Science and Systems Engineering at the University of Arkansas, Little Rock, who received the Vannevar Bush Award; Dr. Kristi Anseth, Patten Associate Professor, Department of Chemical and Biological Engineering, University of Colorado, and Howard Hughes Medical Institute Investigator, who received the Alan T. Waterman Award; Dr. Oliver W. Sacks, Clinical Professor of Neurology at the Albert Einstein College of Medicine who received the individual Public Service Award; and the Alfred P. Sloan Foundation, which received the group Public Service Award. On behalf of the Board, the Chairman thanked Susan Fannoney and other staff responsible for the smooth operation of the Awards Dinner.

Finally, the Chairman reported that he had asked the members of the Nominating Committee to continue to serve and develop a slate of candidates for the opening that will be created in the Executive Committee when Dr. Richardson's Board term ends this month. He asked the Nominating Committee to report back in time to hold elections for this position in August.

3. NSF Director's Report

The Director introduced four new senior staff appointments: Dr. Michael Willig, Director of the Institute for Biological Studies at Texas Tech University, to Director, Division of Environmental Biology in the Directorate for Biological Sciences; Dr. Sangtae Kim of Purdue University and Vice President for Information Technology (IT) of the Lilly Research Offices to Director, Division of Shared Cyber infrastructure in the Directorate for Computer and Information Sciences and Engineering; Dr. Michael Reischman, formerly Director of the University Programs Office of Aerospace Technology, NASA, to Deputy Assistant Director, Directorate for Engineering; and Mr. Joseph Burt to Director of the Division of Human Resources Management after 22 years with NSF.

In a congressional update, Dr. Bement said he testified March 17 before the House Science Committee on legislation related to coordination of federal green chemistry research. The House passed this bill April 21, but no Senate version has been introduced. Dr. John Brighton, Assistant Director for Engineering, testified March 24 before the House Science Committee in a hearing on a bill to establish an interagency working group on Windstorm research. On March 31 Dr. Judith Ramaley testified on H.R. 4030, a bill to establish a medal to recognize outstanding private sector contributions to math and science education. The House passed this bill April 21, but no Senate version has been introduced.

Dr. Bement reported that he met with House Appropriations Subcommittee on VA, HUD and Independent Agencies Chairman James Walsh and Ranking Member Alan Mollohan before testifying April 1 with Dr. Washington to the subcommittee, where members expressed concern about funding levels for programs aimed at states and institutions that have not typically received significant NSF support. Dr. Bement added that briefings have been held for congressional staff on the NSF merit review process, priority setting, budgets, personnel and staff, Science and Technology Centers, the Math and Science Partnership Initiative, and IT requirements at NSF. A hearing on high performance computing before the House Science Subcommittee was cancelled, and will be rescheduled. The Senate Committee on Commerce, Science, and Transportation plans an upcoming hearing on climate change research.

Finally, he reported that the NSB Chairman has requested him to put on hold any further negotiations with the Smithsonian Institution (SI) in relation to a memorandum of understanding for implementing the policy change approved by the Board in March 2004. The NSB Chairman had received a request from a U.S. Senator that no further steps should be taken to implement the Board's recent policy change regarding eligibility of SI researchers to apply for NSF grants. After further consultation with Board Members, congressional staff and OSTP, the NSB Chairman agreed that the NSF Acting Director would stop his negotiations with SI on a memorandum of understanding to implement the policy change. The Chairman has notified the Senator that the Board will not take any further action toward implementing such a policy change until OSTP has completed its

government-wide review of Federal researchers who compete for other Federal funds, and consensus for implementing the Board's SI resolution has been reached by Congress (See Attachment 4).

4. NSB Committee Summary Reports

a. Executive Committee (EC)

In Open Session, the NSB Executive Committee approved the minutes of their March meeting, and discussed the 2003 Executive Committee Report. The annual Executive Committee report summarizes the previous year's activities, membership of the committee over the last year, and the meetings that have been held. Last year the Executive Committee did not act on behalf of the full Board. The committee endorsed the report and requested that Dr. Bement deliver the report to the full Board to complete the process.

In Closed Session, the committee discussed personnel and future budget issues.

b. Audit and Oversight (A&O)

Mr. Tom Cooley, NSF Chief Financial Officer, discussed a policy issue raised in a recent audit: Charges for Extra Compensation Above Base Salary for University Researchers. NSF's implementation is more restrictive than the policy in OMB Circular A-21, "Cost Principles for Educational Institutions." Other agencies, e.g. the NIH and DOD, rely on Circular A-21 cost principles without separate coverage. Mr. Cooley recommended that NSF-specific coverage be deleted from the NSF Grant Policy Manual ([NSF-02-151](#)) and that NSF rely solely on OMB Circular A-21 as policy in this area. The committee voted unanimously to recommend this to the full Board [*Approved by the full Board at Open Session.*]

Dr. George Strawn, NSF Chief Information Officer, discussed NSF's continued success in aligning business goals with IT activities, computer security at NSF, and interagency initiatives. NSF has been an active participant in efforts related to grants, including a new effort to share common grant management.

Dr. Fae Korsmo, Office of Integrative Activities (OIA), presented several highlights of the 2003 NSF Merit Review Report, including issues related to proposal pressure, program officer workload, and reviews of the quality of merit review provided by NSF Committees of Visitors.

Dr. Tina Boesz presented the OIG Semiannual Report, and Dr. Bruce Umminger, OIA, shared the draft transmittal letter. The committee approved the letter and recommended that the full Board approve it. [*Approved by the full Board at Open Session.*]

Dr. Mark Wrighton informed the committee that, in response to a congressional staff request for the Board to look into cost related issues for NSF appointments under the Intergovernmental Personnel Act (IPA), Visiting Scientists, and other temporary workers, the NSB Chairman requested that the A&O Committee also address this issue as part of its effort to address the

recommendations of the recent National Academy of Public Administration report (*National Science Foundation: Governance and Management for the Future*, April 2004). The A&O Committee will examine both the costs and benefits to NSF and the wider community of using rotators. A&O will factor into its analyses the ongoing work of the NSF Inspector General, who is also looking into IPA issues related to costs, as well as the ongoing Office of Personnel Management examination of this issue.

In Closed Session, the OIG presented information about several ongoing investigations.

c. Education and Human Resources (EHR)

The Chairman, Dr. George Langford, thanked NSF staff and EHR committee members for their service. Special acknowledgement was given to the contributions of committee member Dr. Pamela Ferguson.

Dr. Langford reviewed the major items the committee addressed over the past two years, including the review process for evaluating the EHR portfolio; the working groups looking at K-12, undergraduate and graduate education; the progress of the Math and Science Partnerships program; the EHR Task Force on National Workforce Policies for Science and Engineering that produced the NSB report: *The Science and Engineering Workforce-Realizing America's Potential* (NSB-03-69); and the workshop and report on Broadening Participation. The committee asked that progress in these activities be followed at future meetings.

Dr. Thomas Windham, Senior Advisor for Science and Engineering Workforce in the Office of the Director, presented information on “Minority Serving Institution Clusters” as a recent example of how the HBCU's (Historically Black Colleges and Universities) are making STEM (science, technology, engineering and mathematics) Ph.D. training a high priority.

Dr. Robert Richardson, Chairman of the Subcommittee on S&E Indicators, informed the committee that the White House transmitted *S&E Indicators 2004* to Congress on Thursday, April 22, with the message that it is the “16th in the series examining key aspects of the status of S&E in the U.S.”

The committee members reviewed the revisions to the draft report *Broadening Participation in Science and Engineering Research and Education* (NSB-04-41) and resolved to forward it to the full Board for approval for posting for public comment. The draft would be posted for 30 days on the NSB Web site. Following the public comment period a revised draft reflecting comments will be prepared by the EHR committee to be presented to the Board at the August meeting for approval for publication.

Dr. Judith Ramaley, Assistant Director for Education and Human Resources, introduced plans for EHR to develop a prospectus (five-year time frame) to help identify and inform future opportunities for EHR/NSF investments in cyber learning research and development. EHR staff described the current progress, outlined a set of workshops

and/or roundtable discussions that are planned as a companion effort, and presented some leading edge examples of cyber infrastructure-supported education that cut across the NSF portfolio.

d. Programs and Plans (CPP)

The Committee on Programs and Plans held discussions on establishing a new process for setting priorities for large research facilities and a process for re-examining the prioritization of existing “new start” MREFC projects. The committee took action on three award recommendations and received a report on the Underground Laboratory project. It also received updates from the Subcommittee on Polar Issues, the Task Force on Long-lived Data Collections, and the *ad hoc* Task Group on High Risk Research.

Dr. Joseph Bordogna, NSF Deputy Director, made a presentation on the current MREFC panel process. The committee discussed the process used by NSF and the NSB to select and prioritize multiple competing large-scale research facility projects. A draft white paper defining a new process for the NSF and the NSB to select and prioritize multiple competing large-scale research facility projects was discussed, revised, and forwarded to the full NSB with a unanimous CPP recommendation for approval.

CPP held a discussion regarding the re-examination of the priority order for existing MREFC “new start” projects, taking into consideration the criteria recommended by a report of the National Academies. In Closed Executive Session the committee deliberated and unanimously approved a re-prioritization that was recommended to the full NSB for approval.

The committee considered three new award actions: Network for Earthquake Engineering Simulation (NEES) Consortium Operations: FY 2005-2014; Two-Year Extension of Award for Operation of the National High Magnetic Field Laboratory and Plan to Address Recompetition; and IceCube Neutrino Detector Observatory. Award recommendations were forwarded to the full NSB for approval.

e. Polar Issues (PI)

The CPP Subcommittee on Polar Issues heard an update from the Office of Polar Programs (OPP), including news of a recent medical evacuation of three people from McMurdo Station and a tragic helicopter crash on the North Slope of Alaska in which one member of the Arctic research team from the University of Alaska Fairbanks was killed.

The OPP Director informed the subcommittee of a successful Arctic Science Summit held last week in Iceland on planning for an International Polar Year (2007-2008). The subcommittee heard a presentation on the status and science goals of IceCube, the neutrino detector project, a joint project of OPP and the Directorate for Mathematical and Physical Sciences at South Pole Station.

The subcommittee received presentations about the science infrastructure at both poles. In the Arctic this included many projects and a range of facilities, from remote field camps to large ecological research stations, icebreakers, and aviation, and an effort to achieve balance across the diverse needs of the Arctic science community. In the Antarctic, the components of infrastructure were described, including science support, telecommunications, transportation, and facilities. OPP described a long-range plan for McMurdo Station, implementation of which depends on balancing needs across the program.

Following the Open Session, the subcommittee closed the meeting to discuss the IceCube Neutrino Detector Observatory as an NSB action item.

f. Strategy and Budget (CSB)

Open Session

Dr. Maxine Savitz recognized the contributions of Dr. Pamela Ferguson to the committee, especially her interest in diversity issues and in establishing appropriate processes for Board activities. Dr. Savitz also introduced John Wilkinson, Office of the Director, as the new CSB Executive Secretary.

Dr. Peter Freeman described the strategy and planning for the transition of the Information Technology Research (ITR) Priority Area into the core NSF programs after this year. The transition is proceeding seamlessly with four general themes identified: continuation of IT projects, integration into new core activities, continued interdisciplinary collaborations, and exploration of new opportunities.

The committee discussed the NSF responses to questions posed at the CSB meeting in March concerning impacts of budget and funding decisions on proposals, awards, and participation. In general, the information provided was responsive, and additional detail was given during the Closed Session presentation.

Dr. Bement discussed the long-range planning process in general and provided the context for the FY 2006 budget request. He noted that the administration has consistently identified clear budget priorities: securing the homeland, winning the war on terror, and reducing the deficit. There is a close correlation between NSF funding and non-defense discretionary spending, although NSF has done slightly better than the larger Federal portfolio. Since 1995, NSF's budget has increased by 81 percent, and total non-defense discretionary spending is up by only 62 percent. He reminded the committee that there are established parameters for NSF funding. Some are official NSB guidance (e.g., 22-27 percent for Tools per *Science and Engineering Infrastructure for the 21st Century: The Role of the National Science Foundation* [NSB-02-190]) while others evolve from historic trends (e.g., People at about 20 percent and Ideas at about 50 percent). The NSF budget process includes both top-down guidance (from the Board and the Office of Management and Budget [OMB]) and bottom-up guidance (from the Assistant Directors). Dr. Savitz noted the timeframe for the production of the budget request to

OMB and asked that a CSB telephone conference be held in late June or early July to discuss the status of the budget request and to provide additional guidance.

Closed Session

Dr. Bement provided information on the FY 2006 budget outlook and projected budget scenarios. He discussed NSF strategies and investment priorities under these scenarios, and the committee members provided guidance on the number of budget levels and on what to protect in a decreasing or flat budget and what to promote in a stronger budget climate.

The committee agreed that, using Section 22 of the NSF Authorization Act of 2002 as a basis, CSB and the full Board will produce in October a short “impact document” to reflect the difference between the actual budget and the authorized level for use in discussions with administration and congressional staff.

g. *ad hoc* Task Group on High Risk Research

The Board Members present (Drs. Ford, Sequeira, Washington, and Wrighton) discussed comments on the working paper that was distributed to all NSB Members before the meeting. Comments were also invited from NSF staff who had previously been provided portions of the working paper. There was a consensus that the topic is an important one, and work should continue on a workshop. Comments focused on a definition of “transformative research” that distinguishes it from related terms such as “high risk,” on the impact of resource pressures on NSF program managers who attempt to fund transformative research, and on next steps.

In summary, Dr. Crosby said that work would continue on the working paper and planning for a workshop, which is tentatively scheduled for September at the Santa Fe Institute. Board Members were invited to submit names for workshop participants, and NSF staff was encouraged to submit comments on the draft paper. A revised working paper and workshop plans will be circulated before the August NSB meeting.



Michael P. Crosby
Executive Officer

- Attachment 1: NSB-04-49
- Attachment 2: NSB/EC 04-6
- Attachment 3: NSB-04-75
- Attachment 4: Chairman’s Letter
- Attachment 5: NSB-04-97

MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: Closed Session Agenda Items for August 4-5, 2004 Meeting

The Government in the Sunshine Act requires formal action on closing portions of each Board meeting. The following are the Closed Session Agenda items anticipated for the August 4-5, 2004 meeting.

1. Staff appointments
2. Future budgets
3. Grants and contracts
4. Specific Office of Inspector General investigations and enforcement actions

A proposed resolution and the General Counsel's certification for closing these portions of the meetings are attached for your consideration.



Michael P. Crosby
Executive Officer

Attachments (2)

PROPOSED
RESOLUTION
TO CLOSE PORTIONS OF
381st MEETING
NATIONAL SCIENCE BOARD

RESOLVED: That the following portions of the meeting of the National Science Board (NSB) scheduled for August 4-5, 2004 shall be closed to the public.

1. Those portions having to do with discussions regarding nominees for appointments as National Science Board members and National Science Foundation (NSF) staff appointments, or with specific staffing or personnel issues involving identifiable individuals. An open meeting on these subjects would be likely to constitute a clearly unwarranted invasion of personal privacy.
2. Those portions having to do with future budgets not yet submitted by the President to the Congress.
3. Those portions having to do with proposals and awards for specific grants, contracts, or other arrangements. An open meeting on those portions would be likely to disclose personal information and constitute a clearly unwarranted invasion of privacy. It would also be likely to disclose research plans and other related information that are trade secrets, and commercial or financial information obtained from a person that are privileged or confidential. An open meeting would also prematurely disclose the position of the NSF on the proposals in question before final negotiations and any determination by the Director to make the awards and so would be likely to frustrate significantly the implementation of the proposed Foundation action.
4. Those portions having to do with specific Office of the Inspector General investigations and enforcement actions, or agency audit guidelines.

The Board finds that any public interest in an open discussion of these items is outweighed by protection of the interests asserted for closing the items.

CERTIFICATE

It is my opinion that portions of the meeting of the National Science Board (NSB) or its subdivisions scheduled for August 4 – 5, 2004 having to do with nominees for appointments as NSB members and National Science Foundation (NSF) staff, or with specific staffing or personnel issues or actions, may properly be closed to the public under 5 U.S.C. § 552b(c) (2) and (6); those portions having to do with future budgets may properly be closed to the public under 5 U.S.C. § 552b(c) (3) and 42 U.S.C. 1863(k); those portions having to do with proposals and awards for specific grants, contracts, or other arrangements may properly be closed to the public under 5 U.S.C. § 552b(c) (4), (6), and (9) (B); those portions disclosure of which would risk the circumvention of a statute or agency regulation under 5 U.S.C. § 552b(c) (2); and those portions having to do with specific Office of the Inspector General investigations and enforcement actions may properly be closed to the public under 5 U.S.C. § 552b(c) (5), (7) and (10).

/signed/

Lawrence Rudolph
General Counsel
National Science Foundation

MEMORANDUM TO MEMBERS OF THE NATIONAL SCIENCE BOARD

SUBJECT: 2003 Annual Report of the Executive Committee

In accordance with the requirements of Section 7 (d) of the National Science Board (NSB) Act of 1950, as amended, I hereby submit the annual report of the NSB Executive Committee. This report covers the period from May 2003 through April 2004. I have served as Acting Director of the National Science Foundation (NSF) and NSB Executive Committee Chair since February 22, 2004. Dr. Rita Colwell served as NSF Director and NSB Executive Committee Chair from May 2003 until February 21, 2004.

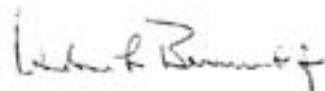
The elected membership of the Executive Committee during the past year was Dr. Warren M. Washington, Dr. Diana S. Natalicio, Dr. Robert C. Richardson and Dr. Delores Etter. Mr. Gerard Glaser, Acting NSB Executive Officer, served as Executive Secretary to the Executive Committee from May 2003 to July 27, 2003. Dr. Michael P. Crosby, NSB Executive Officer and Director of the NSB Office, served as Executive Secretary of the Executive Committee from July 28, 2003 through April 2004.

The Executive Committee met six times during this period: five meetings at the NSF in Arlington, Virginia, and one meeting on the campus of Xavier University in New Orleans, Louisiana. Oral reports of its activities were made at meetings of the full NSB and are reflected in the minutes of those meetings.

During this period the Executive Committee took no actions on behalf of the NSB.

May 21, 2003 Executive Committee Meeting (Meeting 03-3)

The Executive Committee approved the annual report on the 2002 activities of the Executive Committee.



Arden L. Bement, Jr.
Chairman
Executive Committee

2005 Calendar of National Science Board Meetings

February 7-8 (Monday-Tuesday)
[Annual Retreat/Site Visit]

March 29-30 (Tuesday-Wednesday)

May 25-26 (Wednesday-Thursday)
[Annual Meeting]

August 10-11 (Wednesday-Thursday)

September 28-29 (Wednesday-Thursday)

November 30 - December 1 (Wednesday-Thursday)

April 27, 2004

The Honorable Christopher S. Bond
Chairman
Subcommittee on VA, HUD and
Independent Agencies
U.S. Senate
Washington, D.C. 20510

Dear Senator Bond:

Thank you for your letter of April 23, 2004 in which you describe your concerns on the recent action by the National Science Board (NSB) regarding the eligibility of Smithsonian Institution (SI) researchers to apply for National Science Foundation (NSF) grants.

The Board shares your concerns for setting no precedent that would allow Federal research agencies or Federally funded research centers to become eligible to apply for NSF grants. For this reason, the Board required that no change in existing policy would be implemented unless and until such time that we would be assured that such a precedent would not be made. We had also planned to consult further with key members of the Congress and the Office of Science and Technology Policy (OSTP) to ensure that there was consensus agreement for implementation once a draft memorandum of understanding (MOU) between NSF and SI had been negotiated.

In response to your request, I have asked the NSF Acting Director to discontinue negotiations between NSF and SI to develop draft MOU implementation language and procedures. At the NSB's May 3-4, 2004 meeting, I will recommend to my colleagues that the Board consult further with Congress and OSTP on this issue. I will also recommend that the Board take no further action toward implementing such a policy change until OSTP has completed its government-wide review of Federal researchers who compete for other Federal funds and consensus for implementing NSB's SI resolution has been reached by Congress.

The Board greatly appreciates your long-standing and significant support for the National Science Foundation. If you have any questions concerning NSB's strategy in dealing with this issue, I will be happy to meet with you or your staff to discuss it further.

Sincerely,

/signed/
Warren M. Washington
Chairman

Cc: A. Bement, NSF
J. Marburger, OSTP
D. Natalicio, NSB

Priority Setting for Large Facility Projects Summary

This white paper defines the process used by the National Science Foundation (NSF) and the National Science Board (NSB) to select and prioritize multiple competing large-scale research facility projects. This process has evolved to be more clearly visible to the community and to the Congress. Evaluation stages, evaluation participants, and evaluation criteria for selection and prioritizing of projects are now more clearly defined.

The following summary highlights key elements of the process. Later pages describe the process in more detail.

- NSF nurtures and develops candidate facility projects by working with the research community, building consortia, and maturing high-risk technology.
- While projects are developing, the NSF sponsors forums for evaluation of all aspects of proposed projects. This includes evaluation within and across fields, and the use of the National Academies and the Directorate Advisory Committees, as appropriate. The NSF will clarify the criteria used during this development stage, drawing on the first and second ranking criteria proposed by the National Research Council task force on *Setting Priorities for Large Facility Research Projects*.
- The final stage during which NSF develops a project is the *readiness* stage. It has formally defined entry and exit gates, defined in terms of specific criteria through which a project enters and leaves.
- NSF will define as a science road map those science objectives for which large facilities *may* be required. It is that set of *NSF Science Objectives* that provides an overarching, cross-discipline context for evaluating the value of a proposed facility in comparison to other investments.
- The Director will present the Board with all projects that are developed enough to pass through the entry gate into the *readiness* phase. The Board will be asked to concur that the conditions necessary to pass the entry gate have been addressed.
- The Board maintains a set of guidelines that constitute the entry criteria for projects that move to the *Board approved* stage. These will be updated taking into consideration the third ranking criteria proposed by the National Research Council.
- The NSF Director will – from time to time – nominate one and preferably groups of projects that have attained readiness while in the *readiness* stage. The Board will evaluate those projects against the entry criteria for the *Board approved* stage, and move some of them to that next stage. The Board will prioritize *Board approved* projects in light of how the projects advance *NSF Science Objectives*.
- The Director will include *Board approved* projects into the annual NSF budget proposals in priority order, as budget is available.
- The NSF will maintain a Facility Plan that lists facility projects that are in various stages of construction, in the *Board approved* stage, and in the *readiness* stage. The Facility Plan will map the projects against the objectives contained in the *NSF Science Objectives* document. On an annual basis the Director will provide an update of the Facility Plan, along with a description of candidate facility projects that are on the horizon.

Priority Setting for Large Facility Projects

Detailed Description

The rationale and the criteria used to select and prioritize facility projects to be funded by the National Science Foundation (NSF) should be clearly and publicly articulated. This paper describes that process as executed by the NSF and the National Science Board.

The process can be viewed as a sequence of stages through which candidate facility projects progress. NSF defines and implements early stages during which a candidate facility project is first proposed, and then developed. It is during these early stages that project plans are developed within the community. Technology risk is reduced, sometimes with NSF-funded technology explorations. Appropriate community evaluation groups critique and evaluate the project. This includes ad hoc workshop groups in one or more disciplines, NSF Directorate Advisory Groups, and, in some cases, convened National Academies groups. It is the Director's MREFC Panel that manages this process.

The final project development stage is called the *readiness* stage. A project achieves full readiness while it is *in* the *readiness* stage. Readiness is defined in terms of a clearly defined science program, construction engineering plans, plans for operation subsequent to construction, budget projections, and late stage evaluation of the proposed project both by the research community and within the NSF.

It is in the early stages and the *readiness* stage that the appropriate first and second rank evaluations suggested by the National Research Council task force on *Setting Priorities for Large Research Facility Projects* are first performed. First level ranking includes assessment by researchers in a field or interdisciplinary of the scientific and technical criteria for a project. The second rank evaluation assesses the proposed project from the view of related fields. The second ranking should be performed by the NSF with advice from its Directorate Advisory Committees, and any other community groups that the NSF causes to be convened. Over time the NSF should evaluate and adapt the first and second ranking criteria and publish them publicly.

The ability to evaluate multiple projects can only be accomplished in a context of stated objectives. So, NSF should develop and maintain a document that summarizes *NSF Science Objectives*. The *NSF Science Objectives* document would summarize the guiding science objectives of all of NSF, with emphasis on objectives for which large facilities may be required. It is recognized that some objectives can be attained without the use of large facilities. Models for this document include the national academies report, *Connecting Quarks with the Cosmos*, and the GEO directorate document entitled *NSF Geosciences Beyond 2000*. The *NSF Science Objectives* document should be short; should be a summary of the objectives as stated across the NSF directorates; and it should be updated periodically, as needed, by the Foundation.

The *readiness* stage is concretely defined. It has an entry gate and an exit gate. It is the Director, with the advice of the MREFC Panel, who proposes projects to the Board that are believed to be ready to move through the entry gate into the *readiness* phase. The Board is asked to concur that the conditions, necessary to pass the entry gate to go into the *readiness* phase, have indeed been addressed. The Foundation will clearly articulate how conditions have been met to qualify a project to move through the entry gate into the *readiness* stage. Conditions will include:

- community groups and the relevant directorate advisory groups have evaluated the project and assess it to have very high priority,
- the facility directly addresses one or more objectives in the current *NSF Science Objectives* document,
- technology to create the facility exists or shortly can exist to be used without excessive risk, and
- there is no lower cost or alternative to the facility, in order to perform the science and address the objectives that the proposed facility addresses.

The *readiness* stage has an exit gate. The Director may propose *readiness* stage projects for consideration by the National Science Board for entry into the (next) *Board approved* stage. Such projects must have the following exit gate properties:

- project plans are judged to be construction ready by the Large Facility Deputy,
- the budget for construction and for operations costs has been justified to the satisfaction of the Chief Financial Officer,
- the project has been evaluated by the community and the NSF MREFC Panel asserts that it is of high priority to meet specifically identified *NSF Science Objectives*, and
- NSF Director proposes the project to move into the *Board approved* stage.

Note that a project may fall out of the *readiness* stage for many reasons: insufficient priority over the long-term, failure of the plans to reach construction readiness, eclipse by other projects, or any other reason that the Director deems appropriate.

When the Director proposes ready projects from time to time, the Board considers them. The Board strongly prefers to consider multiple projects at a time and may ask the Director to defer singleton projects until multiple projects are ready for consideration. For the Board to approve a project to enter the *Board approved* stage, the Board considers the following:

- research enabled by the proposed facility,
- construction plans together with their risk and readiness,
- budget justification for construction and operation of the facility,
- funding is imminent – likely to be available in the next two or so years, and
- priority of the project against one or several of the *NSF Science Objectives*, including documented evaluations from the community and the relevant Directorate Advisory Committees.

The Board will reconsider its current guidelines for project approval in order to refine, adapt them using the third ranking criteria proposed by the National Research Council, and then re-publish them as the criteria defining the entry gate for a project to move into the *Board approved* stage. If a project is not approved, then the Board remands the project back to the *readiness* stage either with or without prejudice.

Each time that the Board approves one or more projects, it specifies the priority among all projects in the *Board approved* stage. Priority among projects may change at that time. If a project's plans are no longer deemed to be clearly and fully construction ready, the Board will remand that project back to the *readiness* stage (without prejudice) for further work.

Annually, it is the Director who proposes funding for some subset of the *Board approved* projects in their priority order, as budget permits. The Director negotiates with the Office of Management Budget on budget inclusion.

The NSF will maintain a Facility Plan that lists facility projects that are in various stages of construction, in the *Board approved* stage, and in the *readiness* stage. The Facility Plan will map the projects against the objectives contained in the *NSF Science Objectives* document. On an annual basis the Director will provide an update of the Facility Plan, along with a description of candidate facility projects that are on the far horizon, which are at a stage prior to the *readiness* stage.

The Board ascribes the very highest priority to projects that are under construction. There is no priority among them; they should all move forward at a suitable pace. It has long been the policy of the Congress, the Board, and the Foundation to move all such projects forward at a rate consistent with sound engineering plans.