

**APPROVED MINUTES¹
OPEN SESSION
399TH MEETING
NATIONAL SCIENCE BOARD**

National Science Foundation
Arlington, Virginia
August 6-8, 2007

Members Present:

Steven C. Beering, Chairman
Kathryn D. Sullivan, Vice Chairman
Mark R. Abbott
Dan E. Arvizu
Barry C. Barish
Camilla P. Benbow
Ray M. Bowen
Kelvin K. Droegemeier
Kenneth M. Ford
Patricia D. Galloway
Elizabeth Hoffman
Louis J. Lanzerotti
Alan I. Leshner
Douglas D. Randall
Arthur K. Reilly
Jon C. Strauss
Thomas N. Taylor
Richard F. Thompson
Jo Anne Vasquez

Arden L. Bement, Jr., *ex officio*

Members Absent:

John T. Bruer
G. Wayne Clough
José-Marie Griffiths
Daniel E. Hastings
Karl Hess

¹ The minutes of the 399th meeting were approved by the Board at the October 2007 meeting.

The National Science Board (Board) convened in Open Session at 1:50 p.m. on Wednesday, August 8, 2007 with Dr. Steven Beering, Chairman, presiding (Agenda NSB-07-75, Board Book Tab 14). In accordance with the Government in the Sunshine Act, this portion of the meeting was open to the public.

AGENDA ITEM 7: Approval of Open Session Minutes, May 2007

The Board unanimously APPROVED the Open Session minutes as amended of the May 2007 Board meeting (NSB-07-59, Board Book Tab 14M).

AGENDA ITEM 8: Closed Session Items for October 2007

The Board unanimously APPROVED the Closed Session items for the October 2-3, 2007 meeting (NSB-07-69, Board Book Tab 14N).

AGENDA ITEM 9: Chairman's Report

Dr. Beering reported on several issues:

a. NSF Authorization Act of 2002, Section 14

Dr. Beering reported that he reminded both the Executive Committee (EC) and the chairman of the Committee on Programs and Plans (CPP) that under the NSF Authorization Act of 2002, Section 14 requires that the Board report to Congress any delegations of authority related to funds appropriated for any project in the Major Research Equipment and Facilities Construction (MREFC) account. He will be reporting to Congress that there had been no delegation of authority related to MREFC during the last year. That report will be made by September 15, 2007.

b. Board Visit to Hawaii

Since the May Board meeting, a representative contingent of Board Members visited the state of Hawaii, June 3-9, 2007, and met with leaders from the University of Hawaii, including the President, Vice Presidents and Chancellors of several campuses. The visitation team also met with the Governor and several members of her staff, Hawaii State legislators, science and technology industry leaders, and representatives from local Hawaiian organizations engaged in broadening participation in science, technology, engineering, and mathematics (STEM) fields.

The visitation team was pleased to have the help and advice from the University of Hawaii, NSF staff, Hawaii's congressional delegation, and many others in Hawaii for their time and energy in preparation of this site visit. The team was also shown wonderful hospitality and "aloha spirit" throughout the trip, and had informative and thought-provoking experiences.

In addition to Dr. Beering, the Board visitation team consisted of Drs. Dan Arvizu, Ray Bowen, Kelvin Droegemeier, Karl Hess, Elizabeth Hoffman, and Kathryn Sullivan. The visitation team had discussions and informal meetings with over 100 people on 3 islands over 5 days that covered topics on science and engineering research and education ranging from the floor of the ocean to the furthest reaches of the cosmos.

Many of the briefings and discussions highlighted the enormous value in weaving Native Hawaiian and broader Pacific Islander culture and perspectives into science and engineering research and education in Hawaii. Much can also be learned from the Hawaiian model for proactively broadening participation of under-represented minorities in STEM fields. With this knowledge of experiences and model initiatives, the Board hopes to be better positioned to address national policy issues related to science and engineering research and education, as well as improving guidance and policies for NSF as it continues to enhance its critical support of such efforts in Hawaii and throughout our Nation.

Dr. Beering commended the University of Hawaii for its innovation and leadership in the conduct of science and engineering research and education. Last year, NSF granted more than \$40 million in competitive awards to the University of Hawaii. The Hawaii State government and legislature are also pioneering an “Innovation Initiative” to develop Hawaii's innovation economy and increase STEM skills among students in the islands. Hawaii has already put into practice many of the suggestions of the Board’s STEM action plan.

There were a few issues raised during the site visit that needed further Board discussion or consideration. During Board committee meetings, committee chairmen initiated discussion on some of these issues, which will be included with their committee reports. Dr. Beering asked for additional comments from Board Members who participated in the site visit. Dr. Bowen commented on his pride in the enormous respect for NSF and its staff expressed by all Hawaiians contacted by Board Members during the site visit.

c. Annual Board Retreat, Meeting, and Visit 2008

Dr. Beering reported that the Board reviewed and discussed a list of proposed sites for the 2008 Board retreat, meeting, and visit during Plenary Executive Closed Session. The list of proposed sites was developed by the Board Office at Dr. Beering’s request and with input from various Board Members. The Board recommended that the retreat, meeting, and visit site for February 2008 should take place at Fairbanks, Alaska. Dr. Beering concurred with this recommendation and asked Dr. Michael Crosby, Executive Officer and Board Office Director, to make the appropriate arrangements, and provide updates to the Board at the next Board meetings.

d. Recognition of Board Members

Dr. Beering announced that Dr. Kenneth Ford was recently appointed to serve on the National Aeronautic and Space Administration’s (NASA’s) Advisory Council. He joined 33 other widely recognized scientists and space experts as NASA advisors on key issues and policies important to the space agency’s missions, exploration, and leadership.

Dr. Sullivan, Vice Chairman, announced that Dr. Beering recently received the Institute of Industrial Engineers (IIE) Honorary Award. The award is the highest honor that IIE grants an individual of acknowledged professional eminence who is not a member of the institute. Dr. Beering was acknowledged for a distinguished academic career that includes 10 years as Dean of Medicine at Indiana University and 18 years as President of Purdue University.

e. NSB Meeting Design

Dr. Sullivan reported for the *ad hoc* group of Board Members who are discussing options for Board meeting structure and scheduling in addition to reviewing Board meeting cycles, milestones, and schedules. This is the first review of this topic in a decade, and includes factors that shape the dates and structure of Board meetings and retreat during a year. The initial discussion centered on the findings of the Board's meeting schedule and design by the *ad hoc* Committee on Board Operations of 1997, which was headed by former Vice Chairman, Dr. Diana Natalicio.

AGENDA ITEM 10: Director's Report

Dr. Arden Bement, Jr., NSF Director, reported on the following items.

a. NSF Staff Announcements

Dr. Henry Blount began his Career Senior Executive Service (SES) appointment as Head, Office of Experimental Programs to Stimulate Competitive Research (EPSCoR) on May 27, 2007. During his tenure at NSF, Dr. Blount had served numerous capacities including Head of the Chemistry Division's Office of Special Projects; Director of Program Operations in the Research Facilities Office, Office of the Director; Acting Deputy Division Director for Chemistry; Acting Executive Officer for Chemistry; and most recently as Head of the Mathematical and Physical Sciences (MPS) Directorate, Office of Multidisciplinary Activities from 1997 to 2007. He received his Ph.D. in Chemistry in 1969 from the University of Georgia.

b. Congressional Update

Dr. Bement stated that he had covered the status of the Authorization Bill; the America Competes Act, which would go to the President for approval; and the Appropriations Bill in committee meetings. He reported on the House of Representatives FY 2008 Commerce, Justice, Science, and Related Agencies Bill and quoted from the Statement of Administrative Policy (SAP) relative to H.R. 3093 which states, "H.R. 3093 exceeds the President's request for programs funded in this bill by \$2.3 billion, part of the \$22 billion increase above the President's request for FY 2008 appropriations. The Administration has asked that Congress demonstrate a path to live within the President' top line and cover the excess spending in this bill through reductions elsewhere, while ensuring that the Department of Defense has the resources necessary to accomplish its mission. Because Congress has failed to demonstrate such a path, if H.R. 3093 were presented to the President, he would veto the bill."

AGENDA ITEM 11: Open Committee Reports

a. Executive Committee (EC)

Dr. Bement, EC chairman, reported on two information items: an award to the International Institute of Applied Systems Analysis (IIASA) and another award to the Human Frontiers Science Program (HFSP) involving both NSF and the National Institutes of Health (NIH). Both awards were directed by the Office of Science and Technology Policy (OSTP), based on U.S. national interests and the importance of science. Additionally, Dr. Beering reported on NSF Authorization Act of 2002, Section 14 report as noted in the Chairman's Report.

b. Audit and Oversight (A&O) Committee

Dr. Arvizu, A&O chairman, reported on his informal meeting with NSF and the Office of Inspector General (OIG) staff for an update on some of the specific issues related to the Raytheon audit corrective action plan. Work was proceeding, although some items may go into the next fiscal year. The majority of questioned direct costs and issues related to the categorization of certain indirect costs were expected to be resolved by September 30, 2007. Issues related to local overhead costs were pending cooperation with other agencies, but Dr. Arvizu was optimistic that those issues could also be substantially resolved by September 30, 2007. Some issues will require the contractor to conduct internal control reviews and new issue resolution target dates. Additional actions will be reflected in the update to the corrective action plan prepared later in August 2007. Dr. Arvizu will provide an update to the Board at the October 2007 meeting.

Dr. Arvizu acknowledged the receipt of a copy of a memo from the NSF Director to the OIG, requesting specific audits for next year, and also a memo from the OIG providing their response on their plan for the coming year.

The committee also held a closed meeting by teleconference on July 30, 2007 to discuss an OIG report on Board operations, policies, and procedures. The report had been requested by the Board Chairman. As an outcome of that meeting, Dr. Arvizu directed Dr. Hoffman to prepare a draft statement for A&O to consider regarding the roles and responsibilities of the Board Chairman. Dr. Hoffman presented her draft, along with an alternative that had been developed by the Board Office. The committee discussed the two drafts, and approved a motion to table this issue until the October 2007 meeting. Dr. Hoffman agreed to continue to lead the refinement of the proposed statement and to provide a new version of the statement at the October 2007 meeting.

Another outcome of the July 30, 2007 teleconference was the desire expressed by A&O to further strengthen communications between the agency and the Board by reviewing the manner in which the Board receives its legal advice. One issue was whether or not there is a need for the procurement of independent legal advice in cases where interests or position of the Board may differ from that of the NSF Director. Mr. Lawrence Rudolph, NSF General Counsel, gave a presentation on how the Board currently receives legal advice, and in particular, how the

Office of General Counsel (OGC) is able to serve both NSF management and the Board in situations where their interests may diverge. Mr. Rudolph emphasized OGC's role, as Counsel to the Foundation, which, by statute, is defined as a single Federal agency made up of the Board and the Director. He provided considerations for the Board regarding the "degree of independence," and how the Board will manage this unique statutory organizational structure, which may call for unique solutions. Dr. Arvizu asked Drs. Bowen and Galloway to lead a small group that will include Drs. Camilla Benbow, Kathryn Sullivan, and Richard Thompson to develop an initial draft position for A&O to consider on this matter, which will be further discussed at the October 2007 meeting.

Mr. Salvatore Ercolano, Partner-in Charge with Clifton Gunderson LLP, briefed the committee on the status of NSF's financial statements, audit, and IT security review. Mr. Ercolano reported that the audit was on track. With regard to two reportable conditions, the auditors were evaluating NSF's new procedures for monitoring grants. Progress on monitoring contracts was not as advanced and would likely to be counted either as a significant deficiency or material weakness in the next report. Moreover, inconsistencies in the oversight of contracts have caused the auditors to expand their scope of work over NSF's property accounts. Meanwhile, the review of NSF's IT security program indicates that, in general, security has improved from last year's review. Although there were no significant deficiencies, there will be other weaknesses identified in the report.

Mr. Thomas Cooley, NSF Chief Financial Officer, concurred with Mr. Ercolano's description of the audit status, and outlined plans for Total Business Systems Reviews in 2007 and 2008 for large facilities. He also reported that NSF's Advisory Committee for the Government Performance and Results Act (GPRA) Performance Assessment concluded that NSF had demonstrated "significant achievement" for the three strategic outcomes in the new strategic plan: discovery, learning, and research infrastructure. Mr. Cooley indicated that the Advisory Committee Chairman, Dr. Gloria Rogers, will report to A&O at the December 2007 meeting.

c. Education and Human Resources (EHR) Committee

Dr. Hoffman, EHR chairman, reported that the committee thanked Dr. Cora Marrett for her presentation at the Board luncheon on August 7, 2007, and invited her to participate in EHR *ad hoc* groups and at future meetings of the EHR Committee.

Dr. Jo Anne Vasquez gave a brief report on involvement of K-12 STEM faculty. Dr. Benbow will work with Dr. Vasquez to prepare a proposal on this topic, and Dr. Benbow will be prepared to launch an "Innovations: Preparing the Next Generation of STEM Innovators" subgroup at the October 2007 meeting.

Dr. Hoffman reported on the site visit by a representative group of Board Members to Hawaii, during June 2007. EHR discussed several issues that were identified during the visit to Hawaii, including the impact on how NSF defines "minorities" of specific groups clustered within that definition. EHR plans to identify support mechanisms and improve communication to address those issues.

Dr. Hoffman reported on the *ad hoc* Task Group for Engineering Education and National Action Plan for STEM Education:

ad hoc Task Group on Engineering Education

In the absence of Drs. Wayne Clough and Daniel Hastings, Dr. Louis Lanzerotti reported to EHR on the status of the draft report that the *ad hoc* task group prepared as a result of the two Board-sponsored workshops on engineering education (Board Book Tab 13B) and was coordinated with the National Academy of Engineers "Engineer of 2020 initiative" and the NSF Engineering Directorate leadership. The first workshop was held at the Massachusetts Institute of Technology (MIT) in 2005 entitled, "Engineering Workforce Issues and Engineering Education: What are the Linkages?" The second workshop in 2006 entitled, "Moving Forward to Improve Engineering Education" It was held at the Georgia Institute of Technology and included 23 leading deans of engineering from a wide range of engineering schools across the country. EHR committee members discussed several issues pertaining to the major consequences and impacts of Accreditation Board for Engineering and Technology (ABET) in the process of broadening the engineering education of students. The *ad hoc* task group requested that comments from Board Members on the draft report be provided to Dr. Lanzerotti and the Board Office. A final discussion on the report will be held at the October 2007 meeting.

National Action Plan for STEM Education

Dr. Hoffman reported on the draft *National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics (STEM) Education System*, for which she thanked persons responsible for a lengthy and involved process leading to the action plan draft.

Dr. Vasquez introduced the topic with a brief discussion of her experiences as she represented the Board at several education policy forums in the past few months. At these events she shared provisional recommendations considered by the Board as part of its action plan for STEM education. She also noted that several legislative directives will look at STEM activities at the Federal level.

Dr. Hoffman reported that the development of the action plan had been a long and systematic process for the Board, beginning in December 2005 when the Board held the first of three hearings on what actions could be taken to improve K-12 STEM education on Capitol Hill. The Board held two more hearings in February and March 2006 in Boulder, Colorado and Los Angeles, California respectively. In March 2006, the Board unanimously established a Federal advisory committee to the Board, the Commission on 21st Century Education in Science, Technology, Engineering, and Mathematics. That committee held a series of hearings and presented a draft report to the Board in March 2007, which the Board unanimously accepted.

For the draft action plan, more than 90 experts provided input either by serving on the Commission or one of its working groups or testifying before either the Board or the Commission. Dr. Crosby and Board Office staff have held roughly two dozen meetings with various stakeholders to gather input and support for the action plan.

In March 2007, the Board accepted the Commission report and formed an *ad hoc* group within EHR to oversee the development of the Board's action plan and began to edit a series of draft documents. During discussion at the May 2007 meeting, EHR agreed that the document was headed in the right direction and a goal was put forward for EHR to have ready a draft that could be released for public review and comment at the August 2007 meeting. Dr. Hoffman thanked Board Members who provided comments on the four drafts of the action plan distributed for Board comment since the May 2007 Board meeting.

The committee requested a last round of comments from Board Members on the draft action plan prior to release of the document to the public for comment. EHR unanimously agreed to send the draft forward to the full Board incorporating the edits discussed at the meeting, with the goal to finalize the report, including any public comments, at the meeting in October 2007 in time for the 50th anniversary of *Sputnik* on October 4, 2007. Public comments would be incorporated in the October 2007 draft. Any additional written comments could be sent to Drs. Hoffman and Crosby as well as Dr. Elizabeth Strickland. Dr. Hoffman then recognized Dr. Strickland, Sigma Xi Fellow with the Board Office, who has worked with the STEM Commission and the STEM action plan with the EHR Committee, for all her efforts on this project. Upon the recommendation of the EHR Committee:

The Board unanimously APPROVED the draft *National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System (NSB/EHR-07-09)*, subject to edits approved by the Chairmen of the Board and the EHR Committee

Dr. Vasquez requested that members of the Commission be notified that the draft action plan was approved for public comment. Dr. Hoffman assured the Board that comments from Commission members would be requested. Dr. Hoffman thanked Dr. Vasquez for her efforts as co-chairman of the Commission, working with EHR on this project, and attending many meetings of education colleagues around the country to gather information.

d. EHR Subcommittee on Science and Engineering Indicators (SEI)

Dr. Lanzerotti, SEI chairman, reported that *Science and Engineering Indicators 2008 (Indicators)* is in the final stages. The final version of *Indicators* should be ready in early October 2007 and a published copy delivered to the President in early January 2008.

The "Orange Book," the draft *Indicators*, was provided to the Board members, and comments were received. SEI discussed the "Orange Book" and Mr. Rolf Lehming, Division of Science Resources Statistics (SRS), provided a synopsis of the "Orange Book" reviews and with the author's proposed responses. Upon the recommendation of the subcommittee, EHR approved the following action and forwarded it to the full Board for approval.

The Board unanimously APPROVED the "Orange Book" draft for *Science and Engineering Indicators 2008*, subject to final edits approved by the Board Chairman and SEI chairman.

SEI asked the lead reviewers for each of the chapters to review the final versions of their chapters, and to provide Drs. Beering and Lanzerotti with their comments. SEI also discussed the draft overview chapter and the proposed statistical appendix in *Indicators*, which would be sent to SEI members before Labor Day 2007 for comments and discussed further at the October 2007 meeting. The subcommittee also discussed the *Indicators* cover design, and unanimously agreed on a cover that honors and highlights the International Polar Year (IPY). Dr. Lanzerotti then displayed a draft cover design, which will have an addition of an aurora.

Dr. Lanzerotti reported that the subcommittee addressed the condensed version of *Indicators*, also known as the “Digest,” and will have further discussion on this topic at the October 2007 meeting. He stated that SEI will have a subgroup consisting of Drs. Vasquez, Hoffman, and Benbow to provide appropriate indicators for the Education Section.

The subcommittee discussed the Companion Piece that will accompany *Indicators*. An *ad hoc* group with Drs. Bement, John Bruer, Galloway, Lanzerotti and Mr. Arthur Reilly would hold an initial teleconference to provide policy and data guidance for a Companion Piece that will be devoted to the broad topic of the global marketplace.

Finally, SEI continued planning for *Indicators 2010*. At the upcoming meeting in October 2007, Dr. Lanzerotti planned to provide the subcommittee with proposals for workshops or meetings with groups to discuss updates and improvements in the State chapter of *Indicators* and analyze the coverage of indicators in industry. Additionally, Dr. Griffiths suggested two topics for consideration for the 2010 volume, related to (1) interdisciplinary research and education, and (2) cyberinfrastructure. Topics for *Indicators 2010* will be further discussed at the October and December 2007 meetings.

Dr. Beering commended Mr. Rolf Fleming and Dr. Alan Rapoport, SRS, for all their efforts put forth for *Indicators 2008*. Dr. Lanzerotti added that the SRS staff, the Board Office staff, and the subcommittee deserved much credit as well.

e. Committee on Programs and Plans (CPP)

Dr. Kenneth Ford, CPP chairman, reported that the committee considered the difficulties inherent in planning for action items 6 months in advance, and the potential subsequent workload repercussions. The document, “Transmitting Director's Review Board (DRB) Packages to the National Science Board” (NSB/CPP-05-29), was revised to include the following: “No DRB action will be brought to the Board without NSF having presented background information on such action item to the Board, a maximum of 6 months prior.” Dr. Bement had no objection to the revision, which was approved by CPP.

Dr. Droegemeier briefed the committee on Board's visit to Hawaii, which was reported on earlier in Plenary Open Session.

Mr. Cooley presented an NSF-proposed change to the Board DRB thresholds for action items. Specific changes to NSF's organizational structure had affected the number of awards that must be brought before the Board, for example: the Office for Cyberinfrastructure (OCI) and the Office for International Science and Engineering (OISE) moved to the Office of the Director

(OD), creating the Office of Integrative Activities (OIA) within OD and the Office of Polar Programs (OPP) realignment, which created two divisions where two sections previously existed. These changes could result in a large number of small actions to come before the Board. As a result, NSF proposed to treat OD as the single entity, thus raising the threshold. OD will continue to bring awards to the Board, which require special attention, and inform the Board regarding large groups of awards, as in past practice. The committee resolved to approve this proposal for the current fiscal year only, and hold more extensive discussion in October 2007 before deciding on a change to policy for future awards.

Dr. Lanzerotti provided CPP with a brief update on the Board policy on recompetition of NSF awards, beginning with an overview of the history of this discussion item. Since March 2007, NSF had provided a large amount of data and information, including more detailed information about awards within NSF's center programs, details about the original and ongoing funding instruments for the operations and maintenance (O&M) of NSF's largest projects, including Federally Funded Research and Development Centers (FFRDCs) and multi-user facilities, as well as MREFC projects. Further discussion on this topic will be held in October 2007.

Dr. Mark Abbott also briefed CPP on recent data provided to the Board on facilities O&M. This includes: additional O&M expenditure data (actual and projections through 2013); major cost drivers for O&M; and detailed MREFC information, including proposal development efforts, comparisons of actual to projected expenditures, and ongoing O&M costs once those facilities have been constructed. Further discussion of this topic will also take place in October 2007.

Dr. Kathie Olsen, NSF Deputy Director, presented the annual report on NSF's Major Research Facilities. The report was extensive and covered the cost and schedule status of each project entering the operations phase, in the construction phase, new starts, possible new starts, and on the horizon. Dr. Olsen emphasized the major science question each facility will be assigned to address, and described the impact of those facilities and projected O&M costs over time, which CPP found to be of substantial concern.

At the conclusion of the status report, Dr. Olsen identified the following five topics for further discussion with the Board, which CPP agreed to bring to future meetings.

(1) Appropriate and timely prioritization of future projects: NSF management asked the Board to consider the timeliness of when it first reviews and approves these large investments, which will have impact when the Board prioritizes them. Shifting the review to earlier in the process, may allow for a larger group of projects to prioritize and provide NSF with more information for planning process.

(2) International partnerships: It could be difficult to have solid international partnerships when NSF makes it clear that entering the horizon stage is no guarantee of future funding. This would be a challenge for management as the project moves through the various stages.

(3) Data sharing and interoperability: This topic was raised as an important issue for further discussion.

(4) Control and growth of MREFC projects: This topic was also raised as an issue for future discussion. NSF had implemented a no-cost growth policy, meaning that projects must build sufficient contingency in the early stages of planning, so that any budget increase can be covered by the contingency or by potential descoping.

(5) Integration of MREFC projects with education and outreach opportunities: Discussions on this topic will continue in the future.

Finally, the Board discussed examination of priority order of MREFC new starts. Board policy requires an examination of the priority order of MREFC new starts, at least once a year. This year, NSF was in a positive position of having both the House and Senate Appropriations Bills provide continuing funding for all four of the MREFC new starts that were identified as highest priorities. CPP, therefore, judged undertaking of a re-examination of this priority order to be counterproductive at this time, given the clear intent of Congress to approve funding again for the new-start projects. Although the Board approved an additional new start MREFC project during Closed Session, the addition of only one new start does not require a revision to priority order.

Dr. Ford reported on the status of the following subcommittee, task forces, and *ad hoc* task group:

Subcommittee on Polar Issues (SOPI)

Dr. Barry Barish, SOPI chairman, reported that NSF entered into an agreement with Sweden, for the *Oden* icebreaker to be available for research duty in both the Arctic and the Antarctic. Dr. Barish also reported that SOPI heard a presentation on NSF's International Polar Year (IPY) activities, as well as a report on the IceCube MREFC project, which was in the early stages of operation. Construction on the IceCube project was scheduled to be completed in the FY 2011 timeframe.

Task Force on International Science (INT)

Dr. Jon Strauss, INT chairman, reported that the task force continues to finalize its report, which approved 13 recommendations, subject to further revision. The draft report and the recommendations will be considered at the October 2007 meeting.

Task Force on Transformative Research (TR)

Dr. Randall, TR chairman, informed the committee that the task force heard a report from Dr. Bement regarding NSF's initial steps to implement the recommendation of the Board's report, *Enhancing Support of Transformative Research at the National Science Foundation (NSB-07-32)*. NSF laid out a three-pronged approach to implement the task force recommendation to form a working group in the NSF Director's Office to oversee the planned steps. To facilitate NSF's initial efforts, CPP recommended that the Board approve a change in the NSF's Merit Review Criterion I to specifically include review of the extent to which a proposal also suggests and explores potentially transformative concepts. Upon the recommendation of CPP:

The Board unanimously APPROVED a change in the NSF Merit Review Criteria I to specifically include review of the extent to which a proposal also suggests and explores potentially transformative concepts.

CPP further concurred with the initial steps being developed by NSF to address the overarching guidance provided by the Board, and requested that NSF update the committee on the progress of the developing plan at the October 2007 meeting.

ad hoc Task Group on Sustainable Energy

Drs. Strauss and Arvizu continued to draft a charge for the *ad hoc* Task Group on Sustainable Energy, and will report back to the committee in October 2007.

f. Committee on Strategy and Budget (CSB)

Dr. Ray Bowen, CSB chairman, reported that the committee heard an overview of the NSF Impact of Proposal and Award Management Mechanisms (IPAMM) Working Group. The presentation was given to CSB by Dr. Olsen and Dr. Joanne Tornow, IPAMM Chairman. This 58-page report, which was extraordinary in its content and information, was provided to Board Members. CSB will discuss the IPAMM report at the October 2007 meeting, along with NSF recommendations on Board guidance on award size and duration. CSB expressed its appreciation to the IPAMM working group for its excellent work.

In addition to the above item, Dr. Bement presented a status report on the evolution of the NSF FY 2008 budget request.

Dr. Bowen reported on the following *ad hoc* task group:

ad hoc Task Group on Cost-Sharing

Dr. Droegemeier discussed the *ad hoc* task group's ongoing activities to examine cost-sharing practices and policies within NSF over the last few months. Mr. Cooley and his staff worked to collect and analyze data requests of the Board for this study. This information was provided and the *ad hoc* task group started its review. The analysis of cost-sharing is also of interest and importance to A&O. Dr. Bowen invited members of NSF's other committees to join Dr. Droegemeier in this examination.

Dr. Beering adjourned the Open Session at 2:40 p.m.



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