

**Report of the 2011 Committee of Visitors  
Science and Technology Centers Program  
Office of Integrative Activities  
National Science Foundation**

**I. Introduction**

The 2011 Committee of Visitors (COV) for the Science and Technology Centers (STC) Program met on May 16-18, 2011 in Arlington, VA. This COV was convened to review the STC program management and STC proposal actions that were completed in the period FY2003-FY2010. The Acting Director of the NSF Office of Integrative Activities (OIA), Dr. Clifford Gabriel, provided the Charge to the Committee, and the Director of the STC Program, Dr. Dragana Brzakovic, facilitated the review.

The specific aspects of the STC program addressed by this COV were:

**A. Quality And Effectiveness Of Merit Review Process**

- Quality, integrity, and transparency of the processes used to solicit, review, recommend and document program actions;
- The selection of an adequate number of highly qualified reviewers who are free from bias and/or conflicts of interest;
- Appropriate use of NSF merit review criteria;
- Appropriate use of additional program review criteria; and
- Documentation related to program decisions regarding awards and declines.

**B. Management Of The Program**

- Effectiveness of the pre-award management; and
- Effectiveness of post-award management.

The COV did not attempt to assess the impacts or outcomes of the STC program as these aspects of the STC Program were the subject of a recent review by the American Association for the Advancement of Science (AAAS) (1; 2). However, the COV did use the AAAS reviews as input to the COV review process and specifically looked for places where findings of the AAAS reviews may have had bearing on program management.

OIA staff provided the committee with carefully crafted overviews of the program elements and the decision making processes. The individual committee members had access to all STC proposal jackets except those for which a potential conflict of interest was identified or declared. The review of the proposal management process included presentations by OIA staff, discussions with Directorate/Office Staff, as well as jacket reviews. The jacket reviews were conducted by looking at how pre-proposals make their way from solicitation, to pre-proposal submission, and through to final award. The COV was divided into two groups, one group focused on reviewing a cohort of 15 jackets for the Class of 2005/2006 and the other a cohort of 15 jackets from the Class of 2010. This division helped to minimize

conflicts of interest with COV members who participated in STCs or their review. No COV member was allowed to review Jackets for which their institution was a participant in an STC proposal or award. For each of the two cohorts, there were 15 pre-proposals, of which 9 were invited to submit full proposals, of which 5 then were selected for site visits, and of which 2 were recommended for awards. The focus of the jacket reviews were on the quality of the decision making process as exemplified by the materials and documentation in the jackets. The COV also looked at the post-award management documentation and was briefed on the post-award management process. In addition, there were meetings with OIA staff, as well as staff from the Directorates and Offices, and numerous discussions with NSF OIA staff throughout the process; and additional materials and analyses were requested by the committee and supplied by OIA staff. By the end of the meeting, the committee members had achieved a substantial understanding of the management of the STC Program.

## **II. Program Management**

The STC program is unique among the various kinds of efforts which NSF supports. STCs involve the development of highly innovative interdisciplinary research centers focused on research and education at the interfaces of disciplines and/or will drive entirely new scientific approaches within disciplines. STCs are necessarily of a size and scale of complexity which requires integrated, multi-institutional, multi-investigator efforts. The sizes of the awards are commensurate, ~\$5M/yr for the 2010 awards (\$4M/yr maximum for awards in 2005/2006) and an initial award period of 5 years, with the possibility of a renewal for an additional 5 years. The STC awards are highly prestigious and coveted; solicitations for STCs result in a large number of pre-proposals and intense competition. Program Management is at the heart of the success of the Science and Technology Centers Program: the two key elements are the process of review and recommendation of awards (the competition phase), and the post-award management.

The STC Program Management is an NSF-wide activity that uses different “shared governance” models for the competition phase and the post-award management phase. OIA plays a central and integrative role in each of these phases. In the competition phase, the OIA takes the lead on initiation and management of the STC competition process, receiving both the pre- and full proposals, working with representatives of all directorates/offices to coordinate the different phases of the review activities, and organizing an STC Coordinating Committee, which is formed to oversee the competition. Members of this committee are appointed by Assistant Directors and Directors of Offices that participate in the STC program. Coordinating Committee members serve as liaisons with the program directors in his/her directorate/office that help select reviewers/panelists and run the panels. OIA leads in the development of the Solicitation & Management Plan and works with representatives from all directorates/offices, including the Directorate of Education & Human Resources (EHR), and participates in the selection and management processes to coordinate the different phases of the review process. In the award and post-award phase, the STC award management resides in the directorate or office that is closest technically to scientific focus of the center, with a Technical Coordinator leading an NSF-wide team in the award negotiation and management.

There are five Phases to the proposal review process, Preliminary Proposals Review, Full Proposal Review, Site Visit Reviews, Blue Ribbon Panel Review, and an internal NSF Review based on the Blue Ribbon Panel's recommendations. Each of these phases takes approximately 4 months. Based on the

approval of the Director's Review Board, and as necessary, the National Science Board, the awards are announced and the other proposals are declined. PIs of declined proposals are encouraged to have a debriefing session (virtual or in person) with NSF staff to help clarify any questions they may have.

In the post-award stage, as already noted, an STC award resides in the directorate or office that relates the closest to the areas of science/engineering of a particular center. The award is managed by a Technical Coordinator and, importantly, is a permanent NSF employee with managerial experience. In addition, a representative of the Education and Human Resources Directorate will help to oversee the Center's education activities. OIA provides coordination and guidance from the STC Program perspective and prepares standard guidelines and instructions for all post-award review and reporting functions.

### **Observations and Recommendations:**

- Over the course of the program since 1987, the scientific community has accepted the scale of research collaboration exemplified in the STC design. The large number of pre-proposals confirms the popularity of this concept.
- The STC program is a valuable complement to the single investigator mode of funding. A review of the research topics of the current STC portfolio shows that these address significant scientific and timely societal needs in a way that is unique at NSF. The centers span and integrate across NSF directorates. OIA management is critical to ensuring the communication and centrality necessary to achieve the necessary (NSF) organizational focus.
- The STC program takes appropriate risks. There is clear evidence that many STC's are breaking new ground in disciplinary and cross disciplinary fields with specific examples of centers that demonstrate innovation in emerging areas of science. In some cases the focus of the STC has been to overcome major scientific hurdles, without which the field could not have advanced.
- The competition for STCs is necessarily Foundation-wide and a central office leading the solicitation and management of the proposal review process is essential to assuring fairness of opportunity and uniformity of the proposal review process. The team approach to the solicitation and management of centers is also essential to bringing all relevant expertise to the decision making process.
- The size of the program (budget, number of centers being managed) as well as the cadence of the proposal solicitation cycle is commensurate with the resources available to execute the program.
- Elimination of the mandatory cost sharing requirements after 2005/2006 makes the STC opportunity more widely accessible. With this change came the allowance of host *contributions* to an STC proposal. The COV was not clear regarding the role of contributions from proposing host institutions and how they are viewed by the various review committees and NSF Program Offices. The stated NSF Policy is that contributions *do not* factor into the final decision for an award. However, contributions from a proposing host institution may be seen by reviewers as symbolizing commitment to the STC or a differentiating factor for success. In at least one instance, host contributions were cited in an NSF Program Office in their analysis of an STC Proposal,

though this did not appear to be a factor in the final decision. The COV encourages NSF to be clear and consistent on the way host contributions are to be treated in the various phases of both internal and external review process and assure that host contributions do not factor into STC award decisions.

- The creation of an STC is a long-term commitment by both the proposing institutions as well as the NSF. Currently, NSF technical managers are permanent NSF Program Officers. The COV believes it important to maintain this practice and not use staff on temporary assignment to NSF through the Intergovernmental Personnel Act (“IPAs”) in management of STCs.
- The STCs provide a distinctive opportunity and have a responsibility to promote diversity. The progress of the STCs in diversity is commendable, though more can be done. The NSF should continue to work to increase the participation of underrepresented minorities and women at STCs.
- Data indicate that the STC centers have more diversity than traditional STEM academic departments. The COV encourages NSF to track these younger scientists and engineers to try and ensure that they have the opportunity to take leadership positions in the future. The AAAS report includes valuable data to assist NSF in tracking and managing these issues.

### **III. Quality and Effectiveness of Merit Review Process**

The STC Program evaluates proposals in a multi-phase merit review process organized by program staff in the Office of Integrative Activities (OIA) and an STC Coordinating Committee consisting of 1-2 representatives from each of the directorates and participating offices. The Office of General Counsel provides guidance on conflicts-of-interest at all stages of the review process, and all reviewers are vetted by OIA staff to avoid conflicts-of-interest.

At all stages of the competition the same review criteria are used. The criteria include intellectual merit; broader impact; integration of research and education; integration of diversity in center programmatic efforts; value-added of funding the activity as a center; proposed Leadership and Management Plan; and integrative nature of the proposed center.

The five phases of the review process are described below.

**Phase I: Preliminary proposal Review:** Pre-proposals are grouped based on focus areas and assigned to panels for review. Panelists are selected with input from the relevant directorate(s) and OIA staff. Proposing institutions whose preliminary proposals are judged most promising by panels and NSF staff are invited to submit full proposals.

**Phase II: Full Proposal Review:** Proposers receive the comments of the preliminary proposal evaluation panel and are given 3-4 months to prepare a full proposal. Full proposals are evaluated both by ad hoc reviewers (mail in) and in the panel review process. The full proposal review panel uses the criteria above to identify a small number of full proposals deemed worthy of site-visit reviews; the other

proposals are declined. PIs on invited proposals have an opportunity to respond in writing to the ad hoc reviewers' and panelists' comments.

**Phase III: Site Review:** A site visit team consisting of external experts considers the required criteria and the vision and potential legacy of the proposed center. This review focuses on unresolved issues identified earlier in the review process, and gives special attention to the proposed plans for management and leadership of the Center. The site visit team prepares a written report to advise NSF. Again, the PIs have an opportunity to respond in writing to the written report of the site visit team.

**Phase IV: Blue Ribbon Panel Review:** A Blue Ribbon Panel of external experts is selected and convened by NSF to conduct a comprehensive review of all documents pertaining to the proposals that are site-visited, and to rank order them. It also provides a brief statement about each proposal. In developing its recommendations, this committee considers: the relative merit of the STC proposals using the required criteria, the potential national impact and legacy of the proposed activity, the balance of awards among scientific fields, geographical distribution, and the combined ability of the proposed center to meet the objectives of the STC Program.

**Phase V: Internal NSF Director's Review Board:** Based on the Blue Ribbon Panel's recommendations, NSF staff members (OIA staff and program directors) prepare funding recommendation "packages" and forward these to the Director's Review Board. Based on the approval of the Director's Review Board, the awards are announced and the other proposals are declined. PIs of declined proposals are encouraged to have a debriefing session (virtual or in person) with NSF staff to help clarify any questions they may have.

### **Observations and Recommendations**

- In general, the reviewers provided substantive comments supporting their assessment of the proposals. In rare cases the panel summaries were too brief or incomplete, this should never happen. This cannot be changed overnight, and is a process of continuous improvement. We commend the progress made so far and encourage NSF to continue to be diligent in the training of reviewers on the importance of providing substantive comments on all relevant review criteria.
- Pre-Proposal Panel: Overall, the pre-proposal panel summaries provided the rationale for the panel consensus. However, the COV identified a few cases of summaries that contained inconsistencies between the written reviews and the final panel recommendation. In cases where there are differences of opinion in the written reviews and/or panel discussions, the rationale for the final recommendation needs to document the rationale for the final decision and explain apparent inconsistencies.
- Blue Ribbon Panel: The summaries provided by the blue ribbon panels (BRP) were concise, often providing a limited rationale for their recommendations. The panel has access to a large amount of data on which to prepare their responses and make their recommendations. Applicants would benefit from more detailed summaries from the BRP Review.

- Jacket documentation supports the decisions that were made. For example, when there was strong support or consistent lack of support for a proposal, the rationale was generally quite clear. However, in cases where there were mixed reviews, the rationale for the decision was not always clear.
- The implementation of the E-Jacket system for the STC Program needs to ensure that all documentation related to a proposal submission from the pre-proposal stage to a declination or final award jacket and post-award materials be seamlessly linked together for easy access and review.

#### **IV. Qualifications of Reviewers**

As described above, the review process for the STC proposals involves five phases to the final selection. For each of the first four stages, external peer review is used to judge the merit and broader impacts of the proposed effort. In general, NSF shows strong commitment to ensuring a well-qualified, diverse, and balanced pool of reviewers free of potential Conflicts of Interest (COI) at each stage of the review process. The reviewers are typically selected from input from the relevant directorate(s) and OIA staff. For the Blue Ribbon Panel, Assistant and Office Directors suggest names for the Blue Ribbon Panel.

#### **Observations and Recommendations**

- The COV is concerned about the adverse effects caused by the overall proposal pressure to the NSF review system (i.e., the length of the process from pre-proposal to award decision, increased difficulty in finding reviewers and panelists without COI especially members of underrepresented groups, etc.). We recommend that some thought should be given to exploring ways to reduce this pressure (e.g., limit the number of proposal submissions).
- Although NSF attempts to ensure an appropriate balance of reviewer characteristics, this was not the case for all panels that were assessed. In general, the panels tend to increase their gender and racial diversity further in the review process. In some instances there was little diversity with respect to gender and ethnicity and in others limited balance in panelist expertise, notably in the pre-proposal and proposal panels. The COV concluded that there is room for improvement, especially in the pre-proposal stage and, in general, extra attention must be given to ensure that each panel has appropriate balance.
- As with any review process, it is important to ensure that reviewers do not unduly bias the review process. We encourage NSF to continue to make reviewers aware of the unintended consequences of bias by increasing emphasis on this issue during reviewer training.

#### **V. Post Award Management**

The post-award management phase is vital to the success of an STC. In this phase, OIA plays a supporting yet still central role, working to assure uniformity and consistency in the development of the Cooperative Agreements, Strategic Plans, and other elements of the post-award management including

the STC Orientation Meeting, the Annual STC Center Directors Meeting, and working to assure consistency in the format and approach to STC annual site visits and review.

NSF takes an active role in STC post-award management. The mechanism for award management is the Cooperative Agreement. The Cooperative Agreement establishes a common understanding between the NSF and the STC of how the STC intends scientific, technical, and operational responsibilities. The principal vehicle for setting these expectations is through the development of the STC Strategic Plan, which is a required part of the Cooperative Agreement.

One of the partner institutions acts as the lead institution and accepts overall management and budgetary responsibility for the proposed STC. The Center Director provides the leadership to develop and lead a diverse team to fulfill the vision of the Center. S/he is responsible for the management, staffing, and resource allocation of the Center, and for serving as the liaison between the Center and the national network of STC Directors. The Center team develops a management plan to share responsibilities appropriately.

STC Directors participate in the National Network of STC Directors. This group works to share experiences and best practices, address common issues and opportunities, and facilitate linkages and cooperation among STCs. Each Center establishes and annually convenes an External Advisory Committee (EAC). The function of the EAC is to provide guidance, advice, and direction for all of a Center's activities, consistent with its vision, goals, and objectives. The EAC membership is subject to NSF approval and must include representatives from those sectors served by the Center (e.g., academic institutions, industry, state and local agencies, national laboratories). The EAC must include members from groups that are underrepresented in science and engineering (for example, women, persons with disabilities and minorities).

### **Observations and Recommendations**

- The Directorate/Office leadership in the post-award process is appropriate and appears to be effective. The supporting role of OIA brings a Foundation-wide perspective and uniformity to the post-award management process.
- The Cooperative Agreement is a very effective vehicle for post-award management. The development of the STC Strategic Plan is a particularly important practice and important to STC success.
- The COV viewed the Annual STC Reviews as an important mechanism for gauging the progress against the strategic plan, outputs and outcomes, cohesion of the participants, and the management of an STC. The COV feels that an "on-location" Annual Review (a Site Visit) is particularly important in the fourth year of an STC as NSF prepares for a decision to renew the STC Award. In other years, the COV felt that Annual STC Reviews could be accomplished through either Reverse-Site Visits or Virtual-Site Visits, as appropriate. A decision to make a reverse or virtual site visit, versus an on-site review, should be documented and should depend on the degree of tangible progress against the STC strategic plan.

- The focus on education and diversity in the STC strategic plans is commendable. Some doubts were expressed about the impact of the education projects and the COV encourages greater focus on problem definition to provide a basis for the design of the education initiatives. Few of STC education programs appear to be based on a review of local contexts or educational research literature. However, more emphasis on collection of evaluation data that could differentiate between individual successes and resulting aggregate impacts is important.
- It is a challenge to design and pursue education programs that meet authentic needs. Many of the undergraduate and graduate programs are successfully engaging a wider diversity of students in STC research groups. However those programs that target K-12, especially elementary grades, vary in their ability to measure their impact. The COV commends the OIA staff for focusing on strategic planning and assessment that integrates research and education in the early stages of new centers and encourages continued diligence on collecting accurate evaluation data. Associate directors for education would play a key role in this area.
- The COV panel is concerned that the management of STC centers uses effective mechanisms for subsequent inclusion of researchers who are new to NSF. In the 2005 and 2010 awards, data indicate no participation by principal investigators that are new to NSF even though approximately 15-20% of PI's of who submitted pre-proposals were in this category. The data demonstrate the same trend for Co-PI's.

## **Acknowledgement**

The 2011 STC COV acknowledges and thanks the NSF staff for their hard work and support throughout the COV process. The COV would like to recognize Dr. Dragana Brzakovic for her effective and timely contributions in support of the COV.

## **References**

1. **Chubin, Daryl E, et al.** AAAS REVIEW OF THE NSF SCIENCE AND TECHNOLOGY CENTERS INTEGRATIVE PARTNERSHIPS (STC) PROGRAM, 2000-2009 FINAL REPORT. *AAAS Web Site*. [Online] 2011. [Cited: May 16, 2011.] [http://php.aaas.org/programs/centers/capacity/documents/stc\\_aaas\\_full\\_report.pdf](http://php.aaas.org/programs/centers/capacity/documents/stc_aaas_full_report.pdf).
2. **Mason, Sally;** THE NSF SCIENCE AND TECHNOLOGY CENTERS INTEGRATIVE PARTNERSHIPS PROGRAM, Report of the AAAS Blue Ribbon Panel. *AAAS Web Site*. [Online] 2011. [Cited: May 16, 2011.] [http://php.aaas.org/programs/centers/capacity/documents/STC\\_BRP\\_Report.pdf](http://php.aaas.org/programs/centers/capacity/documents/STC_BRP_Report.pdf).

**CORE QUESTIONS and REPORT TEMPLATE**  
for  
**FY 2011 REPORT TEMPLATE FOR**  
**NSF COMMITTEES OF VISITORS (COVs)**  
**Science and**  
**Technology Centers: Integrative Partnership program**

**Guidance to the COV: Science and Technology Centers (STC): Integrative Partnership Program.** The STC program is an NSF-wide program where the competition is coordinated by the Office of Integrative Activities (OIA) and the award oversight employs a shared governance structure whereby a center is managed by cognizant Directorate/Office staff in coordination with the OIA staff.

This COV activity will be different from the standard NSF process because of the nature of the STC program. When looking at operations, the typical COV focuses primarily on addressing questions about the quality of the merit review process for proposals, including the appropriateness of external reviewers and panelists and use of the NSF review criteria. In addition, a typical COV looks at the results of NSF investment. ***This COV is charged with addressing the quality and integrity of the merit review process and effectiveness of the program operations in the context of award oversight and management. The quality of the results of NSF's investments was the subject of a separate review organized by AAAS and the findings are posted at <http://www.aaas.org/news/releases/2011/0301stc.shtml>***

Currently, the STC program portfolio consists of seventeen active STCs; six of the awards were made in 2002, six in 2005/06 and five in 2010. NSF will provide the COV with all materials related to the currently active awards and all proposals on which the program took action during the period 2003-2010. This includes material related to award selection in two competitions which led to the awards made in 2005/06 and 2010.

An STC competition is a five phase process which includes: (i) preliminary proposal review, (ii) full proposal review, (iii) site visits, (iv) blue ribbon panel review, and, (v) internal NSF review. Awards are managed by the aforementioned shared governance structure and this COV is charged with evaluating its appropriateness. Material pertaining to the award oversight is available for all 17 active awards and includes annual site visit reports and documentation on regular interactions between NSF staff and each of the centers. The committee should comment on the appropriateness of the annual site visits, the extent to which NSF and special STC merit review criteria are addressed in these site visits, and the extent to which the site visit reports provide guidance to the program on the quality of center activities and the effectiveness of program operations. In order to help address award oversight issues, OIA has developed questions specific to the STC program for the COV consideration—section A.3.

Please note that the COV may choose not to respond to questions on this template if the committee decides that they are inappropriate or not applicable to this review. The reports generated by COVs are used for many purposes, from informing the program staff and NSF management about important directions for the program's future, to assessing agency progress in order to meet government-wide performance reporting

requirements. In the latter case, they are made available to the public. Since material from COV reports is used in NSF performance reports, the COV report may be subject to an audit.

We encourage COV members to provide comments to NSF on how to improve all areas, as well as suggestions for the COV process, format, and questions. For past COV reports please see <http://www.nsf.gov/od/oia/activities/cov/covs.jsp>.

<b>Date of COV:</b> May 16 – May 18
<b>Program:</b> Science of Technology Centers Program
<b>Directorate:</b> NSF Crosscutting Program
<b>Review of Actions from program inception to present, with focus on FY 2006-2008</b>  <b>Awards:</b> 2 awards from each of the competitions held in period 2003-2010, total of 4, as selected by the chair of COV.  <b>Declinations:</b> 3 declinations/competition that were site visited; total 6, randomly selected. 4 declinations/competition of full proposals; total of 8, randomly selected. 6 declinations/competition of pre-proposals, randomly selected.
<b>Total number of actions within Program during period under review:</b>  <b>Awards:</b> 17  <b>Declinations:</b> 387
<b>Manner in which reviewed actions were selected:</b> <i>Reviewed actions were selected based on their occurrence within the time-frame of January 1 2003-December 31 2010.</i>  <i>Four Center awards selected by Chair; 6 declinations of proposals that were site visited, 8 jackets of full proposals declinations and 12 jackets of preproposal declinations, all randomly selected.</i>

**PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT**

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past eight fiscal years*. Provide comments for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

**A.1 Questions about the quality and effectiveness of the program's use of merit review process.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

**QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS**

1. Are the review methods at different stages of competition (for example, panel, ad hoc, site visits) appropriate?

**Yes, the review methods at the various stages of the competition are appropriate.**

Comments:

**Pre-Proposals:** Panel reviews are the primary means of review at the pre-proposal stage. Use of panels at this stage is appropriate and may increase the efficiency of the process by establishing a deadline, and ensuring some measure of consistency.

**Proposal Stage:** Use of ad-hoc and panel reviews is appropriate at the proposal stage. Ad-hoc reviews provide NSF an opportunity to obtain broader input to the deliberative process and the panel reviews. Panel reviewers can also request additional ad-hoc reviews if necessary.

**Site Reviews:** On-site reviews are an important part of the review process. Such reviews provide an opportunity to judge the commitment of the institutions, team cohesion, the center leadership, mission, and roles of the partner institutions. It also provides an opportunity to gather more information on the proposed center's commitment and strategies for addressing education, diversity, and knowledge transfer issues. Applicants have an opportunity to respond to concerns raised by site visit teams.

**Blue Ribbon Panel:** Blue ribbon panels provide reviews of all the site visit reports. They provide an independent and objective review by a team of individuals with broad expertise.

Source: Jackets and the EIS.

2. Are both merit review criteria addressed

a) In individual reviews? **YES**

b) In panel summaries? **YES**

c) In Program Officer review analyses? **YES**

Are additional program criteria adequately addressed in a)-c)? **YES**

**Comments:**

Reviewers were asked to respond to three additional program criteria: a) Value-added of funding the activity as a Center; b) Proposed Leadership and Management Plan; and c) Integrative Nature of the Proposed Center. In addition, reviewers were asked to evaluate the integration of research and education and the integration of diversity in center programmatic efforts. All of the additional criteria were appropriately addressed.

Source: Jackets

3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals?

**YES**

**Comments:**

In general, the reviewers provided substantive comments supporting their assessment of the proposals. In rare cases the panel summaries were too brief or incomplete, this should never happen. This cannot be changed overnight, and is a process of continuous improvement. We commend the progress made so far and encourage NSF to continue to be diligent in the training of reviewers on the importance of providing substantive comments on all relevant review criteria.

Source: Jackets

4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?

**YES**

**Comments:**

- a. Pre-Proposal Panel: Overall, the pre-proposal panel summaries provided the rationale for the panel consensus. However, there were a few summaries that contained inconsistencies between the written reviews and the final panel recommendation in cases where there were differences of opinion on the panel. In such cases, the rationale for the final recommendation needs to address the apparent inconsistencies.
- b. Panels: Overall, the panel summaries provided the rationale for the panel consensus. An important part of the overall review process is the opportunity provided to proposed center directors to respond to the panel summaries.
- c. Blue Ribbon Panel: The summaries provided by the blue ribbon panels were concise, often providing limited rationale for their recommendations. The panel has access to a

large amount of data on which to prepare their responses and make their recommendations. Applicants can benefit from more detailed summaries from the panel.

Source: Jackets

5. Does the documentation in the jacket provide the rationale for the award/decline decision?

**YES**

(Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.)

Comments: When there is strong support for the proposal or consistent lack of support for a proposal, the rationale is generally quite clear. In cases, where there were mixed reviews, the rationale for the decision was not always clear.

Source: Jackets

6. Does the documentation to PI provide the rationale for the award/decline decision?

**Yes, in most cases**

(Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.)

Comments: As discussed above, there is some room for improvement in explanation of the rationale when the panel recommendation is not unanimous. It is important to note that applicants have an opportunity to receive a debrief.

Source: Jackets

7. Is the time to decision appropriate?

**YES**

(Note that time to decision for full Center proposals is extended due to the use of a multi-stage process including site visits.)

Comments: While the process takes time, it is a well structured and thorough decision making process. It is not apparent how to shorten without compromising the integrity and thoroughness of the process.

Source: Jackets and EIS-Web COV module.

8. Additional comments on the quality and effectiveness of the program's use of merit review process.

The implementation of the E-Jacket system needs to ensure that all documentation related to a proposal submission from the pre-proposal stage to a declination or final award jacket be linked together for easy access and review. A hyperlink on the cover of the full proposal to the pre-proposal will be helpful.

**A.2 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

#### **SELECTION OF REVIEWERS**

1. Did the program make use of reviewers having appropriate expertise and/or qualifications?

**YES, in most cases**

Comments:

Source: Jackets

2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups?

**YES, In most cases**

Note: Demographic data is self reported, with only about 25% of reviewers reporting this information.

Comments: In some cases there was little diversity with respect to gender and ethnicity and in others limited balance in panelist expertise. There is room for improvement, especially in the pre-proposal stage and in general, extra attention must be given to ensure that every panel has appropriate balance.

Source: Jackets and EIS-Web COV module.

3. Did the program recognize and resolve conflicts of interest when appropriate?

**YES**

Comments:

Source: Jackets

4. Additional comments on reviewer selection.

We encourage NSF to continue to make reviewers aware of the unintended consequences of bias by increasing emphasis during reviewer training.

**A.3 Questions concerning the management and of the program under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.**

### **PROGRAM MANAGEMENT**

1. Management of the program:

1a. STC program management model-- including the roles of the OIA staff, the STC Coordinating Committee, and the technical coordinators.

The competition for STCs is necessarily Foundation-wide and a central office leading the solicitation and management of the proposal review process is essential to assure fairness of opportunity and uniformity in the proposal review process. The team approach to the solicitation and management of centers is also essential to bringing all relevant expertise to the decision making process.

1b. Management of review processes (pre-award)

OIA's leading role in managing the proposal review process is essential to fairness and uniformity of the review process.

1c. Post-award review and management—effectiveness of management tools (e.g., site visits, videoconferencing, annual PI meetings)

Having awards managed by the Directorates/Offices is appropriate. OIA's supporting role is important to provide a "Foundation-wide" perspective on the management of STCs.

Comments:

2. Does management of the program provide for portfolio that is relevant to national priorities, agency mission, relevant fields and other constituent needs?

**YES**

Comments:

The STC program takes appropriate risks. There is clear evidence that many STC's are breaking new ground in disciplinary and cross disciplinary fields with specific examples of centers that demonstrate innovation in emerging areas of science. In some cases the focus of the STC has been to overcome major scientific hurdles, without which the field could not have advanced. The Program supports the NSF Mission and Goals, as well as national priorities in science, technology, and education.

3. Recommendations to improve the program.

Several recommendations to strengthen aspects of the program are found in the COV report.

4. Additional comments on program management

The role of OIA in the STC process is seen as central to the STC Program success. The competition for STCs is necessarily Foundation-wide and a central office leading the solicitation and management of the proposal review process is essential to assuring fairness of opportunity and uniformity of the proposal review process. The team approach to the solicitation and management of centers is also essential to bringing all relevant expertise to the decision making process..