FY 2007 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: September 27 - 28, 2007
Program/Cluster/Section: Louis Stokes Alliances for Minority Participation
Division: HRD
Directorate: EHR
Number of actions reviewed: 19 Awards: 14 Declinations: 5 Other:
Total number of actions within Program/Cluster/Division during period under review: Awards: 142 Declinations: Other:
Manner in which reviewed actions were selected: **Stratified random sample of award and non-award actions ending in the numerals "2" and "4".**

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 three fiscal years*. Provide comments for *each* program being reviewed and 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 procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[1]
1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments: Overall, the merit review procedures were quite appropriate. However, in one case (#0503372), it was not clear to the panel if the review process took into consideration an apparent loss of accreditation and the closure of an engineering department.	Yes

[1] If "Not Applicable" please explain why in the "Comments" section.

2. Is the review process efficient and effective? Comments: The panel found the review process to be both efficient and effective. The supplemental funding requests with DOE were particularly timely.	Yes
3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? Comments: The individual reviews, both mail and panel, typically provided sufficient information for the PIs to understand the basis for the recommendation.	Yes
4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation? Comments: In a specific award, the criticisms for lack of evidence for Phase I progress should have resulted in a more qualified funding recommendation.	Yes
5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation? Comments: The documentation for recommendations was complete. The program officer is commended for providing sufficient information and justification for his recommendations.	Yes
6. Is the time to decision appropriate? Comments: The time to decision was appropriate usually less than one month.	Yes
7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:	

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[2]
1. Have the individual reviews (either mail or panel) addressed both merit review criteria? Comments: Individual reviews usually addressed both merit review criteria, however, more depth to comments would be valuable for intellectual merit.	Yes
2. Have the panel summaries addressed both merit review criteria? Comments: Panel summaries generally addressed both merit review criteria, however, there was much more emphasis on broader impacts.	Yes
3. Have the *review analyses* (Form 7s) addressed both merit review criteria? Comments: Form 7s generally addressed both merit review criteria, however, there was much more emphasis on broader impacts.	Yes
4. Additional comments with respect to implementation of NSF's merit review criteria:	

[2] In "Not Applicable" please explain why in the "Comments" section.

A.3 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	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[3]
1. Did the program make use of an adequate number of reviewers? Comments: The review of documentation indicated that an adequate number of reviewers were used for the merit review process.	Yes
2. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: The reviewers used had appropriate qualifications.	Yes
3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[4] Comments: For the review period, reviewers represented 19 of 50 states and the District of Columbia. No 2-year colleges reflected in review process for a specific award. The panels lacked appropriate representation of reviewers from the west. In a specific award, it seems that none of the reviewers were from campuses. Documentation showing percentage of ethnic/racial identification of reviewers was lacking.	Yes
4. Did the program recognize and resolve conflicts of interest when appropriate? Comments: The files contained documentation of appropriate resolutions to conflicts of interest.	Yes

[3] If "Not Applicable" please explain why in the "Comments" section.
[4] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

5. Additional comments on reviewer selection:

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[5], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. Comments: Significant collaborations and partnerships. Programs are strong.	Appropriate
2. Are awards appropriate in size and duration for the scope of the projects? Comments: More dollars going toward student support would be helpful.	Appropriate
3. Does the program portfolio have an appropriate balance of: • Innovative/high-risk projects?[6] Comments: There appeared to be an appropriate balance of innovative projects.	Appropriate
4. Does the program portfolio have an appropriate balance of: • Multidisciplinary projects? Comments: There is evidence across traditional disciplines. More evidence was needed to determine the appropriate balance of students' exposure to emerging multidisciplinary areas.	Appropriate
5. Does the program portfolio have an appropriate balance of: • Funding for centers, groups and awards to individuals? Comments:	Not Applicable
6. Does the program portfolio have an appropriate balance of: • Awards to new investigators? Comments: Most of the ones reviewed were older awards.	Not applicable

[5] If "Not Appropriate" please explain why in the "Comments" section.
[6] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

7. Does the program portfolio have an appropriate balance of: • Geographical distribution of Principal Investigators? Comments: It is recommended that more emphasis be placed on soliciting proposals from areas not represented, such as the far west excluding California and the far northeast. We are encouraged that new applications are likely to come from Arkansas, Iowa and New Jersey. The emphasis of where LS AMP Alliances currently exist is very encouraging, given the populations of underrepresented minorities in these areas.	Appropriate with comment
8. Does the program portfolio have an appropriate balance of: • Institutional types? Comments: AMP programs should be encouraged to incorporate community colleges, particularly in leadership roles. Some portfolios did not indicate strong community college involvement.	Appropriate
9. Does the program portfolio have an appropriate balance of: • Projects that integrate research and education? Comments: There was significant evidence of an appropriate balance of projects that integrate research and education.	Appropriate
10. Does the program portfolio have an appropriate balance: • Across disciplines and subdisciplines of the activity and of emerging opportunities? Comments: Evidence of emerging opportunities in a specific award demonstrates that twelve students have been involved in transdisciplinary themes of biodesign.	Appropriate
11. Does the program portfolio have appropriate participation of underrepresented groups? Comments: Both the LSAMP and Bridge to the Doctorate (BD) have excellent participation of underrepresented groups. In fact, LSAMP leads the Nation in the participation of underrepresented groups in STEM at the undergraduate level. LSAMP also leads the Nation in the production of underrepresented students achieving baccalaureate degrees in STEM.	Appropriate
12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports. Comments: Both the LSAMP and BD are relevant to national priorities. They	Appropriate

directly respond to the initiatives indicated as necessary by "Rising Above the Gathering Storm" and the American Competitiveness Act.	

13. Additional comments on the quality of the projects or the balance of the portfolio:
Of note is a very exciting program in the WASEO Alliance regarding the transdisciplinary themes of biodesign. Examples of emerging disciplines listed are: design of new biodevices, biomaterials, biosystems, and bioinformatic networks. This kind of engagement in emerging disciplines should be encouraged in all AMP programs.

A.5 Management of the program under review. Please comment on:

1. Management of the program.
Comments: Overall, very good. Some attention to the metrics of success will be useful. It is further recommended that If emphasis is intended on specific STEM disciplines and emerging opportunities, it should be clearly stated in the LSAMP or the Alliances for Broadening Participation in STEM solicitation.

2. Responsiveness of the program to emerging research and education opportunities.
Comments: There is a clear emphasis on increasing the numbers of under-represented populations. Reviewers' comments did not provide evidence of emphasis on emerging research and multidisciplinary areas.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:
There is documented evidence (Program Solicitation NSF 07-566 – Alliances for Broadening Participation in STEM) that the WESTAT and Urban Institute studies were used as basis for program planning and prioritization.

4. Additional comments on program management: Additional personnel support is needed for the LSAMP and BD if NSF is to achieve recommendation number 5 in the Urban Institute study to, “Replicate and expand the LSAMP program.”

PART B. RESULTS OF NSF INVESTMENTS

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The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio. Since relevant aspects of the Stewardship goal are included in Part A, the COV is not asked to respond to that goal in Part B.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions[7].

B.1 OUTCOME GOAL for Discovery: "*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*

Comments: Portfolios provide evidence that Alliance leadership and students are engaged in current and important research and global applications. In 0533522, located at Arizona State University, under PI Antonio A. Garcia, students are involved in the transdisciplinary theme of biodesign. Examples include designing new biodevices, work in biomaterials and biosystems, and bioinformatic networks.

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens."*

[7]

Comments: Portfolios provide evidence of effective goal attainment. LS AMP Programs provide document evidence of significant increases in baccalaureate degree attainment.

In HRD-0648132, with PI Elnora Daniel at Chicago State University, baccalaureate degree attainment in STEM disciplines for underrepresented minorities has increased three-fold in the past ten years.

In HRD-0402640, in funding recommendation document for Phase III, evidence is presented showing that baccalaureate attainment in the STEM disciplines for underrepresented minorities has increased four-fold in the past ten years. This HRD's PI is Dr. Earl S. Mitchell at Oklahoma State University. Since Native American enrollment represents 43% of the reported enrollment in STEM disciplines, this number indicates how that underrepresented group is supported by the LS AMP program. In the cited documentation, over 3,100 Native American students have received STEM baccalaureate degrees since 1996.

In HRD-0401723, with PI Richard English at Howard University, there was a significant increase in STEM graduates between 2002 (626) and 2006 (1,216).

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools."*

Comments:

Alliance linkages with DOE supplements and the Experimental Program to Stimulate Competitive Research provide additional means by which students are gaining experience with advanced instrumentation, facilities and experimental tools.

B.4 OUTCOME GOAL for Stewardship:" *Support excellence in science and engineering research and education through a capable and responsive organization."*

Comments:

Through the funding provided to LSAMP, stimulus is provided to national and local organizations that might otherwise not be encouraged to seek out students who are talented but may not have either the financial means or the confidence to apply to graduate STEM programs and seek research careers.

As evidence of outstanding stewardship, the Program Director commissioned the Urban Institute to provide a comprehensive study of the LSAMP Program. This study demonstrates excellent outcomes in a visually appealing and clear format that can be easily disseminated throughout the nation. This report serves as a model for other programs seeking similar outcomes. It demonstrates the positive outcome of NSF's return on investment in broadening participation of underrepresented minorities in STEM.

The LSAMP Staff demonstrate dedication and passionate commitment and belief in program goals.

NSF provides national leadership in its role in supporting, nurturing and developing mechanisms to broaden participation of underrepresented minorities in STEM.

PART C. OTHER TOPICS

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

Planning grants may assist declined proposal submitters to present future proposals. Could a planning grant help with assessing management structure and make site-visits, suggesting strategies and implementation? Regional technical workshops might be considered. The committee has concerns that declined proposals are from proposed alliances that have a high number of underrepresented minorities in their student bodies.

The managers of LSAMP and AGEP will need to more closely coordinate the management of their programs as the Bridge to the Doctorate grows. In order for a seamless continuum from the baccalaureate to the doctorate to be realized, NSF's management of the programs needs to be very clear both internally and externally.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

Community colleges have faculty who have been PI's on grants and their leadership roles should be tapped more fully.
We strongly recommend the increased participation of alliance participants with international opportunities.
Increased funding would support the movement into the international realm and into areas not currently part of the LS AMP program. More LSAMP students should be provided opportunities to go abroad and participate in research experiences for at least one semester.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

Recommend increased budget and staff for COV reviewed NSF programs.
Recommend increased synergy and coordination among NSF programs, as there are frequently multiple programs on campus. This Is especially critical for LSAMP, BD and AGEP. In the event that BD and AGEP are on campus at the same time, it is recommended that NSF require the University President to identify one manager with responsibility for both programs.
The Alliances for Broadening Participation in STEM solicitation is a bit confusing. Recommend increased clarity in program descriptions and requirements.
Additional funding is recommended for the Bridge to Teaching pilot program as it addresses an area that has been highlighted by the American Competitiveness Act and other publications as a dire need for the Nation.
The American Competitiveness Act has identified NSF as the lead agency in identifying areas of importance. It is appropriate that NSF increase production of graduates in STEM disciplines.

C.4 Please provide comments on any other issues the COV feels are relevant.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

We suggest a revised orientation session that is uniform for everyone. An overview of the management of the process would be helpful. This would not be prescriptive but would provide an initial structure so that participants could proceed systematically. A system that allows the participants to sooner proceed with the review would be more efficient.

Broader Perspectives on the HRD Minority-Serving Portfolio and Avenues for Future Discourse

In addition to the retrospective appraisal of program performance and administration addressed elsewhere, the 2007 Committee of Visitors for HRD's portfolio of minority-serving programs affords the opportunity for us to think collectively about many higher-order academic issues. Beyond administration and stewardship of the HRD constituents, what considerations are of importance to other recipients of NSF funding and the nation in general? How might these broader themes be implemented in the Division, NSF-wide and beyond? At the request of the Assistant Director for Education and Human Resources and the COV Chair we invite your thoughts on the following thematic areas.

C.6 How can the expertise and benefits realized by the efforts of HRD programs be infused across NSF, not just among directorates and programs but to the areas where discipline-specific inequities in broadening participation persist?

NSF could encourage and develop a mechanism whereby LS AMP students could be involved in research in discipline-specific grants supported by the foundation. Students placed in high-performance areas of science would gain new experiences. Discipline-specific research areas would become aware of the capabilities of early-career scholars. A model to consider are the diversity supplements funded by NIH.

C.7 What role can HRD's programs serve in broadening and deepening STEM issues of importance to all Americans, including the public understanding and appreciation of science and engineering?

A component of the STEM programs could be community outreach. Presentations and tutoring in high schools could stimulate students and make the public aware of the importance of science. A requirement of an award, or an optional supplement to an award, community outreach must be considered.

C.8 In light of the American Competitiveness Initiative (ACI), "Rising Above the Gathering Storm" and other reports, how can successes in broadening participation in academe better inform the production of qualified personnel and outputs in the broader national workforce?

A multi-media campaign that addresses the importance of the opportunities and successes in STEM fields could be instrumental in broadening diversity at earlier levels. From cartoon characters to videos to travelling "shows" would stimulate interest.

C.9 What more can HRD's portfolio do to engage a broader community of applicants, in particular institutions that serve minority STEM students but which are themselves underrepresented in receiving NSF funding for research and education?

Conducting regional grantsmanship workshops would provide opportunities for competitive applications from organizations that do not have NSF funding or experience. This could extend opportunities to 2-year and 4-year colleges, with large enrollments of underrepresented groups, to increase their ability to compete for NSF funding**.**

C.10 In what way are lengthier projects (i.e., those longer than 3-4 years) held accountable for continued funding, as via formative evaluations and other kinds of evaluation?

Current documentation shows that lengthier projects do have to demonstrate success in terms of graduation rates, however, it would be helpful if information related to job status/graduate school status would also be provided. This, too, would demonstrate an added measure of success. A suggestion would be that, in addition to reporting graduation rates, job/graduate school status also be provided.

C.11 How are examples of "What Works" captured in the course of reviewing the portfolio's activities? How are these exemplars disseminated or used to inform broader, more integrated approaches in support of the program's goals?

Not all projects funded by NSF have brochures as attractive as those produced for the LS AMP program. Perhaps other HRD programs will use the LS AMP materials as prototypes for demonstrating successes.

C.12 Appreciating that ethnicity/gender/disability status may be under-reported by PIs and reviewers alike, what efforts are being made to ensure the broadest solicitation, application and utility of this program's awards and the outputs derived from them?

NSF does a good job with ethnicity and gender. It appears that greater outreach is needed to organizations and institutions that focus on disabilities. We encourage NSF to solicit applications from other related institutions, for example, Gallaudet University.

SIGNATURE BLOCK:

For the Louis Stokes Alliances for Minority Participation
Dr. Carl Person, Sub Panel Chair
Dr. Willie Pearson, Jr.
Chair, HRD Bundled COV

FY 2007 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)
Tribal Colleges and Universities Program (TCUP)

The table below should be completed by program staff.

Date of COV: September 26, 2007 to September 28, 2007
Program/Cluster/Section: Tribal Colleges and Universities Program (TCUP)
Division: Human Resource Development (HRD)
Directorate: Education and Human Resources (EHR)
Number of actions reviewed: Awards: 28 Declinations: 6 Other:
Total number of actions within Program/Cluster/Division during period under review: Awards: 28 Declinations: 21 Other:
Manner in which reviewed actions were selected: **All of the awards were requested. Six of the declinations were requested at random.**

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 three fiscal years*. Provide comments for *each* program being reviewed and 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 procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[8]
1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments: Proposals to TCUP were typically evaluated by merit-review panel for implementation projects and ad-hoc/mail review for planning and other projects; at least five individual reviews were obtained for Implementation projects (Phase I, Phase II, STEEP, and Collaborative Partnerships) and at least three	Yes

[8] If "Not Applicable" please explain why in the "Comments" section.

reviews were obtained for all others. These were used to formulate the program director's recommendation to award or decline the proposal. Panel summaries captured the discussion among reviewers during a panel meeting, but generally did not reiterate individual review comments. There were usually 8-9 experts for merit-review panels and 3-8 ad-hoc reviewers (numbers varied by proposal volume). TCUP encouraged the use of external advisory boards by awarded projects and suggested these boards meet at least annually. Annual reports, site visits, midpoint reviews, and PI meetings contributed to post-award monitoring of the portfolio. Appropriate mechanisms were in place to review the TCUP proposals. The panels were diverse and the ad hoc reviews were sufficient to gather enough information on the proposed project to make informed decisions. When the project showed merit yet questions remained, site visits occurred.	
2. Is the review process efficient and effective? Comments: Typical measures of efficiency relied upon dwell time: the time from submission to decision. NSF's benchmark for dwell time was six months for 70% of submissions. Over 90% of TCUP proposals had dwell time of six months or less. Measures of effectiveness relied upon the ratings and recommendations received, and the correlation of those characteristics with the final decision of the National Science Foundation for award or declination. TCUP reviewers were consistent with their ratings per project review. When there were discrepancies between reviewers, program officers/IPA contacted sites for clarification. Occasionally, site visits were needed before funding was awarded.	Yes
3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? Comments: Some individual reviews contained more details than others. The PIs received verbatim, but anonymous, copies of all reviews. The COV found that the information provided in these reviews combined with the panel summary and the follow-up discussion with the TCUP Program Officer provided sufficient information for the PI to understand the basis for the reviewers' recommendations.	Yes
4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?	Yes

Comments:
Panel summaries were very clear. They examined how the intellectual merit and the broader impact of each proposal contributed to the scientific community and campus-wide reforms. The program officer/IPA summarized the review panel recommendations and provided sufficient information for PIs to understand the recommendation. They worked with the PI to begin implementation and/or to modify the overall proposal for funding based on reviewer comments.

Yes

5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?
Comments:
The Program Officer's review analysis captured the sense of the reviewers' findings, and discussed whether and why a recommendation concurred with or ran counter to those findings. The panel summary, review analysis, and direct correspondence were the proposal jacket's enduring record of the rationale for award or decline.

The practice of the program officer summarizing reviewer findings became a valuable and effective monitoring tool. It enhanced the program officer's role which was to help the project succeed in meeting its goals and objectives once implementation occurred.

Yes

6. Is the time to decision appropriate?
Comments:
Dwell time was the time from proposal submission until award/decline decision, as measured against the NSF benchmark of six months for 70% of submissions. The TCUP exceeded the benchmark recommendation of 6 months.

TCUP Dwell Time from FY 2004-2006 for All Proposals

Fiscal Year (FY)	No. of Proposals	Average (Months)	0-6 months	6-9 months
2004	16	4.48	94%	6%
2005	17	5.45	94%	6%
2006	15	4.04	93%	7%

TCUP DWELL TIME For Award and Declination of Proposals		AWD	DECL/ OTHER	Total
2004	Number of Proposals	10 *	7	17
	Average Dwell Time	5.05	3.74	4.48
2005	Number of Proposals	9	8	17
	Average Dwell Time	5.48	5.42	5.45
2006	Number of Proposals	9	6	15
	Average Dwell Time	3.84	4.42	4.07
Total	Number of Proposals	28	21	49
	Average Dwell Time	4.79	4.58	4.70

*note 9 new awards and 1 supplement in 2004

7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:

The COV panel commends the program officers for taking the extra time to develop summary statement that existed in every jacket.

Once the proposal was approved and the award processing began, there were inconsistencies in the amount of time that it took for the DGA to send the award letter and disperse monies. This discrepancy appeared to occur once the approval left the division directors office. This could have a negative impact on implementation and the success of the program, especially on first year startups.

The COV found that the overall merit review system has been consistent in recommendations throughout the TCUP period "under examination".

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

TCUP annually reviews its proposals in accordance with National Science Board criteria for intellectual merit ("Criterion 1") and broader impacts ("Criterion 2") per NSF 99-172 and NSB 96-15 included elsewhere in the COV briefing materials. The additional NSB criteria of Integration of Research and Education ("Criterion 3") and Integrating Diversity ("Criterion 4") are also considered during merit review but are assumed to be more integral to HRD programs among all NSF funding competitions.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[9]
1. Have the individual reviews (either mail or panel) addressed both merit review criteria? Comments: The report format that was developed by the division guided the panel and individual reviewers to address merit and broader impact. The jackets presented evidence that all individual reviews addressed both merit review criteria.	Yes
2. Have the panel summaries addressed both merit review criteria? Comments: The report format that was developed by the division guided the panel and reviewers to address merit and broader impact. The jackets presented evidence that all panel summaries addressed both merit review criteria.	Yes
3. Have the *review analyses* (Form 7s) addressed both merit review criteria? Comments: The program officer wrote a comprehensive review that included both merit and broader impact as it was addressed by the panels. This was evident within each jacket and provided historical knowledge of the acceptance and/or declination process to the Principal Investigator. Additional contact was made with the PIs of declined proposals to help them better understand why a proposal was declined.	Yes

[9] In "Not Applicable" please explain why in the "Comments" section.

4. Additional comments with respect to implementation of NSF's merit review criteria:

No further comments.

A.3 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	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[10]
1. Did the program make use of an adequate number of reviewers? Comments: The COV determined that the program made use of an adequate number of reviewers. TCUP reviewers were selected from a number of sources. These included: Past awardees with no identified conflicts of interest; past reviewers listed in NSF's Proposal and Reviewer System (PARS); personal contacts and appropriate volunteers. Table TCUP A.3.1.A summarized the NSF data on TCUP reviewers by gender, ethnicity, discipline, and institution type. Table A.3.1.B provided data for TCUP Ad-Hoc Reviewers.	Yes

Table TCUP A.3.1.A—TCUP Panel Reviewer Summary[11]

FY	No. of Reviewers (total)	By Gender	By Ethnicity	By Discipline	By Institution Type
2004	8	4 M (50%) 4 F (50%)	1 W (13%) 2 AA (25%) 1 Hawaiian (13%) 4 AI (50%)	4 Nat Sci (50%) 1 App Sci (13%) 1 Educ (13%) 2 Other (25%)	5 Univ/4yr Coll (63%) 1 K-12 School District (13%) 1 Organization (13%) 1 Other (13%)
2005	8	4 M (50%) 4 F (50%)	1 W (13%) 1AA (13%) 1 Hi (13%) 3 AI (38%) 1 Hawaiian (13%) 1 Alaskan (13%)	5 Nat Sci (63%) 0 App Sci (0%) 0 Educ (0%) 3 Other (38%)	5 Univ/4yr Coll (63%) 1 Comm Coll/ 2yr Coll (13%) 1 Organization (13%) 1 Other (13%)
2006	9	5 M (56%) 4 F (44%)	3 W (33%) 2 AA (22%) 4 AI (44%)	2 Nat Sci (22%) 2 App Sci (22%) 0 Educ (0%) 5 Other (56%)	4 Univ/4yr Coll (44%) 2 Comm Coll/ 2yr Coll (22%) 3 Other (33%)

[10] If "Not Applicable" please explain why in the "Comments" section.

Table TCUP A.3.1.B—TCUP Ad-Hoc Reviewer Summary[12]

FY	No. of Reviewers (total)	By Gender	By Ethnicity	By Discipline	By Institution Type
2004	4	1 M (25%) 3 F (75%)	1 W (25%) 3 AI (75%)	2 Nat Sci (50%) 2 Other (50%)	2 Univ/4yr Coll (50%) 1 Organization (25%) 1 Other (25%)
2005	8	5 M (63%) 3 F (38%)	3 W (38%) 1AA (13%) 4 AI (50%)	5 Nat Sci (63%) 1 Educ (13%) 2 Other (25%)	4 Univ/4yr Coll (40%) 3 Government (38%) 1 Other (13%)
2006	5	1 M (20%) 4 F (80%)	3 W (60%) 2 AI (40%)	2 Nat Sci (40%) 3 Other (60%)	1 Univ/4yr Coll (20%) 2 Comm Coll/ 2yr Coll (40%) 2 Other (40%)

2. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: Reviewers were highly qualified and came from a wide range of fields both from education and industry. There was a balance in technical and content expertise and a good balance in understanding tribal colleges and other eligible institutions.	Yes
3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[13] Comments: There was a balance in geography, technical and content expertise and in identifying reviewers with an understanding of tribal colleges and other eligible institutions.	Yes
4. Did the program recognize and resolve conflicts of interest when appropriate? Comments: The TCUP program directors briefed panelists on issues of conflicts-of-interest at the beginning of each panel meeting. All reviewers were given a Form 1230-P	Yes

[11] All categories as self-identified by reviewers to NSF's Enterprise Information System (EIS). Please note that less than 35 percent of reviewers report their demographics last fiscal year, so these data may be limited.
[12] All categories as self-identified by reviewers to NSF's Enterprise Information System (EIS). Please note that less than 35 percent of reviewers report their demographics last fiscal year, so these data may be limited.
[13] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

(Conflict of Interest and Confidentiality) to sign prior to completing their review duties. Very close consideration of potential reviewers' professional history was given prior to his or her selection as a reviewer, to avoid financial or person conflicts of interest. Per form 1230P, a conflict of interest occurred when there was an existing or recent program award with the applicant, individuals on the proposal or other affiliations. Typically one form was collected from each reviewer and applied to all assigned proposals When a conflict was declared by a reviewer, that reviewer was asked to abandon his or her review and dispose of the review materials in a confidential manner. A rating of Conflict or Decline to Review was then logged in FastLane. When a conflict was revealed during panel deliberation, the panelist with the conflict recused him or herself from any discussion involving the proposal posing the conflict. The panel Chair asked this reviewer to step out of the room until the discussion of that proposal was complete.	
5. Additional comments on reviewer selection: TCUP ensured that there was a wide diversity among reviewers geographically and technically. It was important that the program officer/IPA had an understanding of the importance for identifying reviewers who understood the dynamics of TCUP eligible institutions. It appeared the panelists were consistent throughout the TCUP reviews which lent to an even approach when awarding or declining projects.	

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[14], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. Comments: In FY 2005, the TCUP program directors provided a template for annual reports. All Implementation projects after Cohort III were required to use that template for reporting of progress. The annual reporting format provided a consistent understanding to the NSF on how the project was impacting the college/university and the impact that it had/or did not have on student outcomes. However, the COV was not certain how some projects reported uniformly when they were in different development stages such as planning and capacity building. It was also unclear how targeted proposals will comply.	Yes
2. Are awards appropriate in size and duration for the scope of the projects? Comments: The program solicitation suggested Implementation awards were funded up to $500,000 per year for up to three or five years, depending upon the type of award. Reviewers could suggest or program directors could determine that a particular project did not warrant the full costs requested. In such a case, the project leaders were asked to submit revised budgets at a negotiated level. Project leaders were at liberty to decline to do so. Similarly, TCUP's annual budget may not allow funding of all recommended proposals at the requested level. In such cases, the project leaders were asked to submit revised budgets at a negotiated level. Project leaders were at liberty to decline to do so. Planning, unsolicited, or supplement proposals were typically funded at significantly lower levels than Implementation projects.	Yes

[14] If "Not Appropriate" please explain why in the "Comments" section.

Table A.4.2 – Average Award Size and Duration

FY		Total
2004	Number of Awards	7
	Average Annual Dollars	$487,478.21
	Average Award Duration	5
2005	Number of Awards	6
	Average Annual Dollars	$389,746.00
	Average Award Duration	5
2006	Number of Awards	5
	Average Annual Dollars	$495,299.92
	Average Award Duration	5
Total	Number of Awards	18
	Average Annual Dollars	$457,508.03
	Average Award Duration	5

Note: Averages based on implementation awards only.

3. Does the program portfolio have an appropriate balance of:
   - Innovative/high-risk projects?[15]

Yes

Comments:

TCUP has allowed for cultural paradigms to exist in STEM disciplines. Allowing for a better understanding of how Eurocentric STEM philosophies complimented or showed conflict with indigenous belief and learning systems has created changes in educational systems that have enriched the concepts and added value to the learning experience of all students.

Also, TCUP has facilitated the use of innovative technologies that increased the capacity for TCUs and educational systems to have a broader impact within rural communities where landline communications were frequently non-existent.

4. Does the program portfolio have an appropriate balance of:
   - Multidisciplinary projects?

Yes

Comments:

TCUP supported a balance of multidisciplinary projects. They ranged in a variety of foci from science to mathematics depending on the developmental level of the college. More recently established colleges described a capacity

[15] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

building need whereas the more established college needs were often targeted toward specific disciplines that were affecting STEM growth within the institution. The results demonstrated that TCUP provided an appropriate balance of multidisciplinary projects.

5. Does the program portfolio have an appropriate balance of:
   - Funding for centers, groups and awards to individuals?

Comments:

TCUP legislation defined the eligible institutions

See Comment

6. Does the program portfolio have an appropriate balance of:
   - Awards to new investigators?

Comments:
TCUP guidelines strongly suggested that the chief academic officer serve as principal investigator, although engagement of faculty at all professional stages was encouraged. Most P.I.s were the Tribal College Presidents. If tribal institutions determined that they had faculty members who have the capacity to become P.I.s, the institution can designate this through local control. Today, there are staff members who are very capable of managing the programs. However, most staff members wear many hats and may not have time to operate programs. Also, when the TC presidents were engaged as P.I.s, it enabled them to discuss grant programs at other meetings that the TC presidents attended (e.g., AIHEC).

See Comment

7. Does the program portfolio have an appropriate balance of:
   - Geographical distribution of Principal Investigators?

Comments:
Geographic distribution and balance in TCUP was determined on the following categories: Tribally-Controlled Colleges and Universities (i.e., Continental United States); Alaska Native-serving institutions (i.e., Alaska); and Native Hawaiian-serving institutions (i.e., Hawaii).

Yes

Table A.4.7. – TCUP Proposals by Region

State		FY 2004	FY 2005	FY 2006	Grand Total
Alaska	Number of Proposals	2	1	2	5
	Percentage of Proposals	11.8%	5.9%	13.3%	10.3%
Continental US	Number of Proposals	14	14	13	41
	Percentage of Proposals	82.3%	82.3%	86.7%	83.8%
Hawaii	Number of Proposals	1	2	0	3
	Percentage of Proposals	5.9%	11.8%	0%	5.9%
Total	Number of Proposals	17	17	15	49
	Percentage of Proposals	100.0%	100.0%	100.0%	100.0%

8. Does the program portfolio have an appropriate balance of: • Institutional types? Comments: The TCUP founding legislation identified the program eligible institutions as follows: Eligible institutions are Tribal Colleges and Universities, Alaskan Native-serving institutions and Native Hawaiian-serving institutions. Multiple campuses of one university system are normally encouraged to consider collaborative partnership submissions. Executive Order 13021 defines Tribal Colleges and Universities ("tribal colleges") as those institutions cited in section 532 of the Equity in Educational Land-Grant Status Act of f1994 (7 U.S.C. 301 note), any other institution that qualifies for funding under the Tribally Controlled Community College Assistance Act of 1978, (25 U.S.C. 1801 et seq.), and Navajo Community College, authorized in the Navajo Community College Assistance Act of 1978, Public Law 95-471, Title II (25 U.S.C. 640a note). The term "Alaska Native-serving institution" means an institution of higher education that is an eligible institution under section 1058(b) of the Higher Education Act; and at the time of submission, has an enrollment of undergraduate students that is at least 20 percent Alaskan Native students. The term "Native Hawaiian-serving institution" means an institution of higher education that is an eligible institution under section 1058(b) of the Higher Education Act; and at the time of submission, has an enrollment of undergraduate students that is at least 10 percent Native Hawaiian students.	Yes. See Comments
9. Does the program portfolio have an appropriate balance of: • Projects that integrate research and education? Comments: The well established Tribal Colleges were engaging in research and integrating it into their education programs.	Yes
10. Does the program portfolio have an appropriate balance: • Across disciplines and subdisciplines of the activity and of emerging opportunities? Comments: This depended on the capacity of the institutions. Initiatives at well established colleges focused on transformational areas that converged on specific sub-disciplines as opposed to those still in reform processes.	Yes

11. Does the program portfolio have appropriate participation of underrepresented groups? Comments: All Tribal Colleges were established to provide access to equitable education and serve underrepresented groups. Tribal Colleges located in the Continental United States served populations that were predominantly Native American. Alaska institutions had to enroll 20% Native students to meet eligibility criteria, and Hawaiian colleges had to enroll 10% Native Hawaiians in their student body in order to meet TCUP eligibility.	Yes
12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports. Comments: The TCUP was designed to increase the participation and advancement of underrepresented groups and institutions at every level of STEM education and research. This was aligned with national priorities and the mission of the NSF agency. QEM for minorities (2006) outlined the funded activities by major foci which supported relevant fields and the needs of the Tribal Colleges and Universities Program. This report confirmed that TCUP was meeting its goals and objective.	Yes
13. Additional comments on the quality of the projects or the balance of the portfolio: COV encourages TCUP to explore other additional ways to develop leadership within the program. COV recommends that TCUP provide newly established Tribal Colleges' access to funding by participating in collaborations with well established Tribal Colleges. The committee recommends that the current planning grant process be replaced by an initiative that fosters collaboration among Tribal Colleges. The precedent for this recommended change was established in 2004 when the program was reformulated to provide opportunities for colleges to work together on smaller scope projects while maintaining their fiscal and managerial independence...Collaborative Partnerships.	

A.5 Management of the program under review. Please comment on:

1. Management of the program.
Comments:

The program at the time of the COV review was managed by one career program officer and a shared program specialist; additional staffing support has been provided by temporary Interagency Personnel Agreements (IPAs). The program has also increased its collaborations with R&RA constituents within the Foundation, such as BIO and ENG, and national professional societies via extensive outreach effort by TCUP program staff.

Since the IPA was not a permanent position, historically it had often been vacant for lengthy periods thus creating a gap of services to the TCUP client. For example, the position went unfilled from July 2006 to June of 2007. This was especially critical with the Tribal Colleges because there was a need for an active program officer to provide a nurturing oversight and essential technical assistance. The COV recommends additional staff that can act on behalf of the agency and provide direct assistance to the TCUP programs. Also the COV recommends a change in the current budget structure for the Program Officer(s) that will allow them to travel into the field to provide onsite technical assistance. The table below is evidence of the strenuous portfolio that the Program Officer(s) must monitor.

The COV recognizes that in comparison to other programs monitored within the HRD, the TCUP portfolio had fewer clientele; however, the proactive need in the project within the portfolio required additional oversight and support. In addition, "the program staff who manage TCUP also have an unwritten but broad responsibility to serve as liaisons between the tribal college community and the other programs and staff of the NSF" (Initial guidance for 2007 COV reviewers). The COV recognizes that this critical step to develop further opportunities for TCUP clients takes additional staff management time to create these connections and partnerships with other vested stakeholders.

PORTFOLIO/TIMELINE OF THE TCUP PROGRAM

FY 2001: TCUP is established. "Provides for planning and implementation awards to tribal colleges and universities (TCU), as well as institutions of higher education with at least 20% Alaska Native student enrollments (ANS); or 10% Native Hawaiian student enrollments" (NHS).

Eight implementation awards are made: 7 TCUs, 1 ANS [Cohort I]

FY 2002: Five implementation awards are made: 3 TCUs, 2 NHSs [Cohort II]

FY 2003: Program director changed from Victor Santiago to Jody Chase

Four implementation awards are made: 3 TCUs, 1 ANS [Cohort III]

FY 2004: New guidelines (NSF 04-602) establishes the October 18 annual proposal due date, and provides funding for new opportunities: STEEP, CP, and Phase II.

Seven implementation awards are made: 5 TCUs, 2 ANSs, 1 NHS [Cohort IV]

FY 2005: Five implementation awards are made (two are STEEP awards): [Cohort V]

FY 2006: New TCUP Annual Report Template developed and issued to the more recent TCUP awardees for use. Four Phase II awards are made; three new (Phase I) implementation awards are made [Cohort IV].

2. Responsiveness of the program to emerging research and education opportunities.
Comments:

The TCUP program utilized mechanisms to ensure that the colleges continued to grow and evolve and that the goals and objective of the national priorities in STEM reform and research were being met. Essential networking between all stakeholders promoted collaboration and learning about best practices. These strategies included: PI meetings, Leaders' Forums, site visits, coordination with other NSF programs, topic-focused workshops and seminars, (e.g., the TCU Engineering Education Workshop), and informal discussions with nationally recognized leaders in American Indian education.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:

Each year TCUP prepared budget and management plans for a number of contingencies. Ultimately, the program made as many awards as possible with the available funding. The Program Officer provided year-around advisement to prospective applicants and guidance to the active portfolio within the constraints of time and resources.

In discussion with Program Directorate and Program Officer(s) it became clear that even if proposals had quality merit and met broader impact, there were other factors involved in the review analysis. The hierarchal flow provided the checks and balances needed to fund programs. The availability of funding had an impact on the number of programs that were funded. The COV commends the Program Officer on the detailed documented review analysis.

4. Additional comments on program management:
There needs to be travel considerations in relation to the inaccessibility of eligible institutions caused by the remoteness of the areas where most TCUP institutions are located. Most Tribal Colleges are located hours away from airports and city centers. Program Officers must be able to travel to sites to ensure the success of these programs. The COV recommends that frequent site visits occur and that the budget allow for this. Site visits will allow greater technical assistance to the P.I. The COV further recommends that another staff member be provided to the TCUP program.

PART B. RESULTS OF NSF INVESTMENTS

.
The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio. Since relevant aspects of the Stewardship goal are included in Part A, the COV is not asked to respond to that goal in Part B.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: "*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*

Comments:

- **Oglala Lakota College** (PI Fredenberg, 0123149).

  Oglala Lakota College, on South Dakota's Pine Ridge Reservation, is addressing the lack of trained analytical personnel by improving its science and technology curriculum to provide basic and advanced training for American Indian students in laboratory and analytical related fields. The project's long-term goal is to train a pool of highly skilled scientists and lab technicians who will serve their communities as self-employed entrepreneurs or hired employees. Currently, 14 minority students are involved in faculty-supervised undergraduate research projects on the Pine Ridge reservation and surrounding areas. In the four years of the project's efforts, the college has seen the American Indian full-time student enrollment increase every year, with the greatest increases seen in information technology majors. At the same time, matriculation of students into four-year degree programs at partner institutions of higher education has doubled in only three years. This project has made remarkable progress in improving the articulation of Native American students into four-year degree programs, serving the community as well as the graduates themselves.

- **Southwest Indian Polytechnic Institute (SIPI)** (PI Lujan, 0123131)

  SIPI is upgrading its STEM programming, including intensive faculty development, the impact of which has reached almost 100 percent of the college's academic personnel. The Emerging Scholars Program awards stipends (currently 9) to academically gifted STEM majors who then participate in undergraduate research, often in conjunction with faculty at the University of New Mexico. Current projects include mapping the surface of Mars. The strong faculty development and emerging scholars' components of this project have provided a network for mentoring, learning, and teaching improvement throughout SIPI.

- **Alaska and Hawaii Projects** (PI(s) Johnson and Tseng 0123147 0223040)

  The Interior Aleutians campus of the College of Rural Alaska (University of Alaska at Fairbanks) has identified mathematics as the principal barrier to successful pursuit of STEM careers by rural Alaska Native students. This campus, in collaboration with the Bristol Bay campus, has developed an intensive, supportive mathematics instructional strategy that includes summer stipends and research experiences. The project is in its fourth year, and is now expanding its offerings to include science by, in part, conversion of a storage room at one of the remote campuses to an all-purpose science lab. The University of Hawaii at Hilo is helping to launch the next generation of STEM professionals by offering internships to STEM students to participate in research opportunities with STEM faculty. Although faculty from several discipline areas is involved, the unifying theme is cultural relevance to the interns and increased success in their studies. The Kuskokwim campus of the University of Alaska at Fairbanks' College of Rural Alaska is using its award to develop a transfer curriculum in science and math, adding three full time faculty. This has enabled the college to offer chemistry, physics, math, and computer courses, a significant step forward for an institution that has previously offered primarily vocational programs.

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.*"

Comments:

- **Turtle Mountain Community College (PI Davis, 0222546).**

  Turtle Mountain Community College (TMCC), on the Turtle Mountain Reservation in northern North Dakota, has focused its TCUP award on improving the STEM offerings, particularly those offered by distance education, and in particular on attracting significantly higher numbers of American Indian students into STEM studies or majors. Turtle Mountain is therefore actively engaged with students already enrolled at the college, and also with outreach to local high school students and teachers. The Sunday Academies for the reservation high school students and the Youth Summer Camps serve as the primary outreach activities of this project, providing innovative daylong and two-week academies for 9th to 12th graders. The daylong Sunday academies are offered on seven Sundays throughout the academic year and the two-week long sessions are offered in the summer. TMCC faculty, high schools instructors from the reservation and NDSU Engineering faculty conduct the STEM standards-based academies. Students are exposed to laboratory and interactive learning. Two Math and Science Enrichment Camps were held in the summer of 2004, with twenty-five to thirty high school students from the area participating in each of

them. However, the principal focus of the project is at the college level. In the three years of the project's efforts, the numbers of TMCC students graduating in STEM majors has increased from 16 in the baseline year to 35 in Year Two. Of the 35 students who graduated in STEM fields in 2004, 17 transferred to a four-year institution.

- **Salish Kootenai College** (PI Chumrau, 10658)

  The project at Salish Kootenai College is enhancing its academic offerings by developing a Bachelors degree in Information Technology. The innovative project provides three focus strands for students, including networking, systems administration and web development. The curriculum development effort was in response to a local employment need, so that students are more likely to find gainful employment close to home upon graduation. The project began with the pilot cohort of students in the Fall semester of 2003. The pilot cohort consists of eight students, more than double the number that was expected, and the project leaders anticipate another doubling of enrollment when the project enters full implementation next fall. Approximately 60% of the pilot students are American Indian, a group significantly underrepresented in science and technology. Salish Kootenai College is a 2002 Cohort Awardee from the Tribal Colleges and Universities Program.

- **Indigenous Alaskan Natives Succeed in STEM Through Educational Reform** (PI, Barhardt, 8171)

  The Alaska Rural Systemic Initiative (AKRSI) activity in the 20 rural school districts' partnership continues to produce an increase in student achievement scores, a decrease in the dropout rate, an increase in the number of rural students attending college, and an increase in the number of Native students choosing to pursue studies in fields of science, math and engineering. At Ilisagvik College in Barrow, with support from the NSF Tribal Colleges and Universities Program (TCUP), new certificate and degree programs have incorporated STEM field learning into training that meets the needs of natural resource development industries, explicitly blending indigenous knowledge with Western science to achieve a broader understanding of the natural environment. This approach has worked well with Alaska Native K-12 students, and works to qualify Alaska Natives for employment in land management and wildlife biology positions in economically viable technical industries. AKRSI attributes their success in attaining K-12 achievement and retention increases to an educational reform strategy: to foster connectivity and coherence between the formal education system and the indigenous knowledge systems in communities being served in rural Alaska. The AKRSI school reform initiatives have demonstrated the viability of introducing strategically placed innovations that can serve as catalysts around which a new, self-organizing, integrated educational system can emerge. The substantial realignments that are evident in the increased interest and involvement of Native people in education in rural communities throughout Alaska, as reflected in the various indicators summarized in the annual report, point to the applicability of locally driven strategies in shaping reform in Alaska's educational systems.

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.*"

Comments:

- **Southwest Indian Polytechnic Institute** (PI Lujan, 10601)

  The project at Southwest Indian Polytechnic Institute in Albuquerque NM has made significant advances in the technological infrastructure at the college. The Tribal Colleges and Universities Program has supported the establishment of an IT lab available to all students and faculty, as well as training for faculty in the integration of technology into the curriculum. All faculty (100%) have participated in these training opportunities. The college has also strengthened its prerequisites for science, technology, engineering and math (STEM) majors, resulting in fewer students declaring STEM majors, but substantially higher success rates among those majors. Moreover, the enrollment rate is climbing to its former numbers, while maintaining the higher success rates. Of 145 STEM majors in the fall of 2001, 48 (33%) returned the following fall. After the new policies were in place, 55 (43%) of 2002s 128 STEM majors returned the following fall, an increase in the numbers of successful STEM majors, in spite of a lower enrollment. Southwest Indian Polytechnic Institute is a 2001 Cohort Awardee from the Tribal Colleges and Universities Program.

- **Navajo Technical College** (PI Guy, 0408447)

  Internet to the Hogan project is designed to end the digital divide in the Navajo nation, a territory slightly larger than the state of West Virginia. In the process, it also solves what has been called the "last mile problem" and provides a model for educational delivery and economic development. This model is based upon the idea that only peoples who can move from the economic basement to the economic high rise. The project is occurring in one of the poorest places in the United States where mountain ranges, high deserts, and canyon lands make even road access difficult to small communities. The Navajo Nations is the heart of the digital divide in the United States, a place where people from remote communities have to drive seven or eight miles down dirt roads impassible during rain or snow storms to get to the nearest phone.

PART C. OTHER TOPICS

[Section C: Notes were provided, but were not aligned with specific questions as responses.]

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

C.4 Please provide comments on any other issues the COV feels are relevant.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

COV Section C Notes

There is a need for facilitation to bridge students into PhD programs. Currently, there is a gap that exists between high school to junior colleges: from junior colleges to undergraduate programs: from undergraduate to graduate: and graduate to post doctoral.

NSF must consider American Indian Reservations as they develop cyber infrastructure plans for the nation. Currently, twelve high plains states are left out of the Internet 2 research grid. This creates a problem for most TCUPs in the high plains. NSF should support virtual collaborations that allow tribal colleges to partner with research universities and engage and contribute to high quality research. Bandwidth crisis is looming for all students and teachers.

There is a need to build research capacity within the TCUs . Need to foster REL concept within TCU programs. There is a wealth of knowledge that exists on reservation; however, this knowledge is individual and not collective. Research centers have the potential to contribute to the economic infrastructure within our existing impoverished communities because through partnerships with new business and industry.

From working with other cultures, you get transformative research. This collective knowledge fosters a value added system that is both local and global. There has to be a vision of collaboration from the NSF. As we move forward, we need to look at what the future of technology is bringing to the table.

There is a gap that is widening between traditional math and science pedagogy and online/virtual pedagogy. How are we going to meet the needs of the 21st century learner? Colleges of Education are not addressing these needs.

There is a gap of knowledge, a gap of understanding global view and how it's going to impact the world. People tend to operate within their comfort levels; however, this comfort level will essentially become a detriment on how we are preparing our students for STEM disciplines.

To address this dilemma, it is suggest that professional development workshops for STEEP awardees be considered. These sessions should be designed to introduce teachers to new innovative things happening in education.

TCUP needs additional staff. One full-time staff member assisted by one IPA is not sufficient. Recently, the program was without an IPA for 10 months. The nature of the colleges requires a nurturing oversight. This is not possible with only one staff member. There is also a need for additional travel monies. The remoteness of the tribal colleges requires additional travel time and resources. We recommend at least one additional full-time staff member and additional travel expense funds.

SIGNATURE BLOCK:

_____

For the Tribal Colleges and Universities Program (TCUP)
Dr. Carol Davis, Sub Panel Chair
Dr. Willie Pearson, Jr., Chair HRD Bundled COV

FY 2007 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: September 27-28, 2007
Program/Cluster/Section: HBCU- Undergraduate Program
Division: Human Resource Development
Directorate: Education and Human Resources
Number of actions reviewed: Awards: 31 Declinations: 19 Other: 0
Total number of actions within Program/Cluster/Division during period under review: Awards: 65 Declinations: 132 Other: 128
Manner in which reviewed actions were selected: Stratified random sample.

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 three fiscal years*. Provide comments for *each* program being reviewed and 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 procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[16]
1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments: The primary review mechanism used in the HBCU-UP program is merit review panels, for which each proposal must receive at least three reviews. Up to six are assigned for each proposal in order to achieve at least this minimum, even when conflicts of interest occur. The COV's HBCU subpanel assessed the	YES

[16] If "Not Applicable" please explain why in the "Comments" section.

appropriateness of this process by checking whether there were enough reviews done for proposals so that some consensus of opinion seemed to emerge, both in the individual reviews and the panel summaries. By this criterion, the process seemed, by and large, to work, and therefore was judged appropriate. For example, in HRD-0411432, Lott, Lane College, the review process provided a great deal of information on which to base an informed decision, and seemed thus to fulfill its purpose. In some other cases, such as HRD-0625092, Barnett, North Carolina Central University, the mechanism did not seem to provide NSF staff and the PI as much information as would have been helpful. The panel also felt that reviewers should be more emphatically educated on the negative effect of a review that seems to send the message that the reviewer did not actually give the proposal more than a cursory reading; this does occasionally happen. However, in general the process seems to be doing its job in an appropriate fashion.	
2. Is the review process efficient and effective? Comments: In recent years, the average number of reviews per proposal has ranged from about five to nearly six, and so is easily achieving one of its stated goals (at least on average), to prove at least three reviews per proposal. Program officers have also stated that they have found that the reviewer comments are valuable to them to provide input for the feedback they provide proposers when a decision is made to decline. The HBCU-UP subpanel for this COV review also found that the reviews appeared, for the most part, to provide helpful information to proposers, both when funding was offered and when it was declined. Although the subpanel was fully aware that its role was not to re-review proposals, it did seem that in some cases the ultimate decision, and perhaps the remarks in the review analyses, were enough more negative than the tone of the reviewer comments that additional information could have been provided to help explain the apparent discrepancy between the program officer's view and that of the reviewers; for example, this may have been the case in HRD-0625402, Osborne-Lee, Prairie View A&M University. However, again, overall the review process did seem efficient and effective. Also, the process does provide effective feedback to proposers who are not experts in the grants process, and allows them to be able to correct course and resubmit.	YES
3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? Comments: Overall, the individual reviews do provide sufficient feedback to the PI and program officer. In many cases proposals received quite detailed feedback from individual reviewers, although the usual situation was for a proposal to receive a mixture of informative, detailed reviews and others that were sketchy, sometimes just repeating a few points from the proposal (of which the brief statements of intellectual merit and broader impact were favorites for repeating in reviews) along with very generic comments such as that the proposal did not make its case or that too many details were missing. One example would be one specific	YES

project we reviewed in which three of the four reviews were detailed, while one was not so (and also did not seem to focus on pertinent issues). But it was rare that the individual reviews were so lacking in detail that the proposer could not see the reason for the panel's overall opinion stated in its summary, or that a program officer could not discern the individual reasons that led to that overall opinion.	
4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation? Comments: The goal of the panel summary is to provide the PI and the program officer with additional information that arose during the panel discussion of the proposal, as well as to get the panel's collective opinion after hearing each other's views. Overall, the process seems to be accomplishing that, providing sufficient information to both the PI and the PO. In some cases there did seem to be a disconnect between comments in the summary and its final condensed opinion, as well as the outcome of the review; for example, in one specific file we reviewed in which the summary did come across quite a bit more negative than one would expect for a proposal rated "competitive" by the panel and that was eventually funded, particularly since the panel summary explicitly said to address weaknesses and re-submit. In some other cases we reviewed the summary did not seem to convey much useful information (beyond that the proposal and investigators were judged to be top-notch in this case, without much real supporting evidence given in the summary). But overall, the summaries did do their job, and occasionally (e.g., see HRD-0411432, Lott, Lane College) actually seemed to provide more useful information than the individual reviews. We do recommend that panels be instructed to distinguish clearly in their summaries between weaknesses that are easily fixable by further information gathering by the program officer or further conversations between the PI and the PO, and weaknesses that are truly inherent in the proposal and detract from its ultimate worthiness.	YES
5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation? Comments: By providing the actual reviews and the summary, the program officer has been provided enough information to see how their conclusions were reached. Perhaps the panel summaries could use more quotes or direct information from the proposals as further validation of conclusions reached, but what is provided now gives a trail to see a path to the decisions. Of particular use is the communication between the program officer and the applicants where unanswered questions are presented and to which applicants respond (see panel summary, HRD-0411394).	YES

6. Is the time to decision appropriate? Comments: As seen, for example, with HRD-0411394 Hampton and HRD-0411432 Lane, it seems to take about four months from proposal closing until awards are announced. That seems a reasonable amount of time. By making announcements in late April, it gives institutions about four months of lead time to adjust their annual plans for the next academic year. A question that could affect this is when the bulk of HBCUs complete their budgets for the next academic year, and how the timing of the grant awards affects that process.	YES
7. Additional comments on the quality and effectiveness of the program's use of merit review procedures: The following may be against NSF policy for various reasons, but in many cases additional clarifying information requested of reviewers after the fact could straighten out some vague points or potential misunderstandings in the reviews. The subpanel members are aware that there could be serious issues with contacting reviewers again after reviews are completed, and so offer these comments only for what they are worth within the bounds allowed.	

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[17]
1. Have the individual reviews (either mail or panel) addressed both merit review criteria? Comments: By and large reviewers do address both merit questions with a mixture of the level of detail and thoroughness, varying within specific grant applications. For example, in HRD 0625402, one reviewer uses phrases like "the program is well thought out" whereas other reviewers for the same proposal went into greater detail regarding feasibility of success, citing very specific details. Overall, our assessment is that while some of the reviewers are uneven in the depth of their assessments, there are many more substantive statements than cursory ones within one proposal review, providing the PO with an overall substantive assessment of the merits of the proposal. See HRD 0506164 or HRD 0506124.	YES
2. Have the panel summaries addressed both merit review criteria? Comments: There seems to be much more discussion of "intellectual merit" than of "broader impact" for nearly all the proposals reviewed. In some cases the grant proposal itself does not make a very specific case for broader impact, leaving the reviewers without a way to extract a summary statement. It appears that overall reviewers conclude that potentially successful efforts to prepare students for a STEM related career IS the broader impact of the grant, without specification. This is, I think, reasonably, the overall broader impact of all of these efforts, but reviewers could focus a bit more on more local impact in an effort to envision the sequential impact of the work.	YES
3. Have the *review analyses* (Form 7s) addressed both merit review criteria? Comments:	YES

[17] In "Not Applicable" please explain why in the "Comments" section.

Our observations on this issue are contained in the responses to the other questions in this section, but the short story is that the analyses are addressing both, by and large.	

4. Additional comments with respect to implementation of NSF's merit review criteria:

As noted in A.2.1, the specificity of reviews can vary for individual reviews. Overall, reviewers are giving a great deal of effort to assessing the merit of the proposals. Even in cases where one reviewer makes a more cursory than substantive comment, other reviewers for the same proposal provide some balance by being thorough, which provides the PO with the possibility of giving a substantive summary. There may be more discussion and/or guidance for reviewers on the meaning of "broader impact" to steer reviewers away from statements like "contributes to minority students in STEM related fields." Since that is, however, the overall goal of HBCU-UP, and if there are substantive reasons given as to how the agency will accomplish that goal, the statement is not cursory.

A.3 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	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[18]
1. Did the program make use of an adequate number of reviewers? Comments: The program makes good use of the reviewers. Roles were clearly defined with orientations and briefings. The number of reviewers per panel ranged from 3 to 5. A panel of 5 seemed more sufficient in size than a panel of 3, and provided more diversity of thought, more feedback in general to PI's. Reaching consensus does not seem however to be dependent of the number of reviewers.	YES
2. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: For the most part, reviewers seemed to work within institutional departments (i.e. implied expertise) that were aligned with the proposal topics. The backgrounds of reviewers were primarily in the sciences and engineering disciplines. NSF appears to give much attention to the design of panel competence. On one file we reviewed: No. The expertise of the reviewers was in behavioral and life sciences but the proposal was on computer science credentialing. For this proposal, the panel's expertise seems to be irrelevant.	YES
3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[19] Comments: NSF seems to give attention to the diversity of the panel; there is still room for continual improvement. In two submittals we reviewed, reviewers were from the mid-Atlantic, Southeast and west coast. There was a mix of community college, university, state college and independent consultant. In one particular proposal, all reviewers were from HBCU's in the Southeast region.	YES
	YES

[18] If "Not Applicable" please explain why in the "Comments" section.
[19] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

4. Did the program recognize and resolve conflicts of interest when appropriate? Comments: There was no evidence that this was a problem, and the subpanel did not detect any cases in which a reviewer had an undetected conflict of interest.	
5. Additional comments on reviewer selection: There were several instances of panels having predominantly or overwhelmingly male representation. NSF does give attention to the selection of panelists and make-up of panels in other areas. More attention should be given to gender balance of the panels as well.	

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[20], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. Comments: The subpanel felt that the overall quality of the projects supported by the program is high, and in fact that the quality of some of the projects not funded was high enough to have been worthy of funding, if funds had been available to support them.	APPROPRIATE
2. Are awards appropriate in size and duration for the scope of the projects? Comments: The size and duration of the awards seems to match the level of intensity and breadth of the activities for which funding is sought. For the planning grants, it is appropriate that it should only last one year. For institutional change related grants, the funding will necessarily have to be larger and parceled out over an extended period of time. Moreover, giving larger grants time to ramp up the process of implementation makes sense. However, it would be instructive to other institutions if annual reports would speak more specifically to the challenges frustrating implementation and how they were overcome, and then, how the actual time matched up against the proposed timeline. On the other hand, there was concern about whether the known award ceilings reduce the intellectual aspiration or true potential for impact expressed by the applicants. Restated, there is a possibility that the small sizes of funding itself may reduce the value of the projects.	APPROPRIATE
3. Does the program portfolio have an appropriate balance of: • Innovative/high-risk projects?[21] Comments: In one sense, projects being funded are "safe", in the sense that review panels and POs recommend funding for projects that seemingly can be completed successfully. However, many of the proposals were innovative. The language here needs to be clarified, since the subpanel saw a large difference between innovation and high risk. With a good definition given of risk, which is needed here, NSF could consider adding an instruction to panels to include a risk assessment for the proposals it is reviewing.	APPROPRIATE

[20] If "Not Appropriate" please explain why in the "Comments" section.

4. Does the program portfolio have an appropriate balance of: • Multidisciplinary projects? Comments: Many of the projects supported by this program extend across scientific disciplines in its effort to support STEM efforts. There seem to be four foci in the portfolio—Focus on students, focus on faculty, focus on institution and facilities, focus on content; these are all within the scope of the solicitation. Focus on specific disciplines and research within them is not so much stressed, and this lends itself to encouraging multidisciplinary projects. This seems to be happening.	APPROPRIATE
5. Does the program portfolio have an appropriate balance of: • Funding for centers, groups and awards to individuals? Comments: The portfolio does have an appropriate amount of funding for collaborations among groups within HBCUs to support STEM efforts. There are really no awards that could be considered to be for individuals, but this is appropriate for this program.	APPROPRIATE
6. Does the program portfolio have an appropriate balance of: • Awards to new investigators? Comments: Most of the PIs have been around for a long time, and in fact this is assured since they are top executive officers at their institutions. Though the number of PIs who were new investigators was thus small, the number was not zero. We did see evidence of more "youth" among the co-PIs and other major project personnel, both in the literal sense and in the sense that there were some first-time investigators among the co-PIs. Our discussion did address both senses, since we believe that, for this program, it is important that projects have among their principal personnel those who have knowledge of modern directions in STEM education and ways to attract a new generation of students into STEM who may have learning styles strongly affected by technology with which older generations may not be so familiar. In fact, some folks in earlier generations are doing some quite innovative things to reach modern students, but when projects do have a good representation of personnel who have more recently "grown up" with technology and modern pedagogy, the projects are more likely to catch and keep the interests of students.	APPROPRIATE

[21] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

7. Does the program portfolio have an appropriate balance of: • Geographical distribution of Principal Investigators? Comments: It is clear that the program is trying to accomplish this, and seem to be succeeding. The subpanel has no concerns in this area.	APPROPRIATE
8. Does the program portfolio have an appropriate balance of: • Institutional types? Comments: The program does focus on HBCUs, of course. Within the community of HBCUs, most do participate. Efforts could be made to get more participation by two-year institutions, since they do seem to be underrepresented in the portfolio.	APPROPRIATE
9. Does the program portfolio have an appropriate balance of: • Projects that integrate research and education? Comments: We noted one project not funded, which had this focus. Most projects did not integrate research with education, in either of the two senses it could be construed: Student research as part of their education, or research on the education being provided the students. Some projects did do some of either or both, but perhaps more stress could be put on this.	APPROPRIATE
10. Does the program portfolio have an appropriate balance: • Across disciplines and subdisciplines of the activity and of emerging opportunities? Comments: In general, there is an appropriate balance across STEM disciplines and subdisciplines, and some attention is paid to emerging opportunities. Consideration should also be given to thinking outside the box about involving non-STEM disciplines in collaborative efforts (say, with business schools) that could help STEM efforts and mutually support the disciplines.	APPROPRIATE
11. Does the program portfolio have appropriate participation of underrepresented groups? Comments: This portfolio focuses on HBCUs, and the racial and ethnic balance is appropriate for that focus.	APPROPRIATE
12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports. Comments:	APPROPRIATE

The National Academies report "Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future" explicitly discusses the needs addressed by the program. In particular, that report, under its "Enlarge the Pipeline" action (the document's Action A-3), states that "Particular attention should be paid to increasing the participation of those students in groups that are underrepresented in science, technology, and mathematics education, training, and employment.	

13. Additional comments on the quality of the projects or the balance of the portfolio:

We believe that the responses above capture our observations about this aspect of the program and its portfolio.

A.5 Management of the program under review. Please comment on:

1. Management of the program.
Comments:

What is clear is that there are key elements of program management in place—1. Clear and concise goals; 2. A formal review process that has been tested over a period of time; 3. External and internal reviewers; 4. Opportunities for communication between applicants and program managers; 5. Opportunities for mid-term feedback; 6. Personal contact; 7. Oversight; 8. Budget specificity and justification; 9. A timeline for completed activity; and 10. Creative latitude.
These elements among others suggest that there are performance expectations in place along with the latitude for each applicant to address the particular needs of the institution.

There was concern that there was not enough data to associate the management plan with the award and declination outcomes. Given the priorities of the plan, which were explicit enough to create traceable metrics, the program management analysis data should be compiled and then mapped according to those metrics.

2. Responsiveness of the program to emerging research and education opportunities.
Comments:

It appears that some of the program proposals attempt to include new perspectives on pedagogy and areas of study. What would be helpful is to get more analysis of whether the products of those programs add to the knowledge base for those emerging areas. That would be difficult to discern with the evidence presented. All that is present is the descriptions of those products. In a future COV, in addition to the jackets, it may be helpful to see the products that were produced by the

grantees. For instance, one grantee produced teaching aids and lab manuals. Another grantee did not have products as part of its outcomes, but did produce findings. That knowledge may stay buried in their annual report, though it could be useful to others. One such finding was that when implementing a developmental math course, the text books may need to be written on a developmental English level.

Using the findings and products should not restrict NSF to responding to what is found, but should provide a base for thinking forward and exploring the frontier of STEM education.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:

We did not have information that we felt would allow us adequately to address this question.

4. Additional comments on program management:

None.

PART B. RESULTS OF NSF INVESTMENTS

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The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio. Since relevant aspects of the Stewardship goal are included in Part A, the COV is not asked to respond to that goal in Part B.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: "*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*

Comments:

To establish the nation as a global leader in fundamental and transformational science and engineering, it is important to address the workforce issues involving underrepresentation of African Americans and other groups in STEM fields. This program does address that goal directly and effectively, particularly since HBCUs provide an area of great opportunity for doing so, with great potential benefit. The management plan also describes strategies for addressing this outcome goal that should be effective.

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens."*

Comments:

This outcome goal cannot be accomplished without the full participation of groups not currently well

represented in STEM fields, and this program addresses that directly. As already mentioned in an earlier section of this subcommittee report, the NSF Broadening Participation report describes the need, and this program provides a tool. This learning goal, to expand the scientific literacy of all citizens (not just those already focused narrowly in particular scientific areas), is further addressed by the cross-disciplinary nature of many of the proposals. Note that by funding educational STEM advances at HBCUs, the potential also exists for expanding scientific literacy among persons who may be interested in working on advances in science that can be directly applicable to people who have not been well served by science as applied to majority communities.

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools."*

Comments:

Although some proposals in this program address supporting the research infrastructure tangentially through some physical research infrastructure support at HBCUs, the primary focus is on developing the human infrastructure, and the program is doing that well.

PART C. OTHER TOPICS

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The program should find more ways to encourage collaboration across an institution, including with non-STEM departments and units. The management plan does mention the value of this, but it is not reflected in the proposals actually examined. One potential way to address this could be to have the HBCU-UP program consider proposals that add value to existing non-STEM programs within an institution. Examples exist of programs that actually put different portions of an institution at odds with each other, as different units compete for students, and HBCU-UP projects should not add to this. In general the proposals did seem to try to fit projects within a "box" created by the program solicitation, and while it is a pretty good box, ways should be found to encourage proposers to think outside it.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

First of all, the information provided shows that the overall performance is quite good. However, in trying to decide whether particular program-specific goals and objectives are being met, it is important to have good definitions of what the relevant terms mean. For example, in deciding whether a program is contributing to the research infrastructure of the country, it is important to be clear about what research infrastructure means in this context, in particular, whether it specifically means hardware that is used exclusively for research. Also, more information should be gathered, and the new as well as existing data should be examined more thoroughly, if we are to be able to understand whether program-specific goals and objectives are being met. For example, the first program objective in the management plan is to "Develop and maintain a diverse and intellectually vigorous faculty committed to the improvement of undergraduate education," and to achieve that goal it is critical to know as much as possible about the existing pool and what is important to that group (certainly those already in it, but also those who have chosen not to be in it, such as African American researchers in industry and at majority institutions, including their reasons for making their career choices). We did not find much information about students who leave STEM disciplines and their reasons for doing so, and this is very important to understand. HBCU-UP is contributing greatly to STEM's impact on society by improving the scientific literacy of people who do not choose to make STEM their life's work, and NSF should be in a data-supported position to make that case rather than be criticized for failing to convert such students into scientists.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

The program just plain does not have enough money. This is a program that is not even close to the point of diminishing returns with the addition of resources, and the necessary economizations needed to spread available funds as widely as possible can negatively impact fine projects that could really blossom with a small amount of additional investment.

As mentioned earlier in this report, the COV subcommittee for HBCU-UP understood that its role did not include the re-reviewal of proposals, but it did strike us that there were substantially more worthy but unfunded projects than ones that were funded but seemed a bit weak.

C.4 Please provide comments on any other issues the COV feels are relevant.

For this program, proposers did not seem to understand well the difference between intellectual merit and broader impact, perhaps because this program is focused strongly on the latter. They could use some additional instruction on this, to be able to distinguish these clearly.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

The program should map out the COV process for the panelists in diagram form, visually identifying the inputs and outputs for each process step. This will allow the panelists to get an overall understanding of the process and what is needed to make it work. As it was, our subpanel had to invent a good deal of the process on the fly without a good understanding of the inputs, outputs, and what would be needed to get from the former to the latter. This caused some backtracking as we discovered that our methods needed rethinking after we were already partway through them.

Broader Perspectives on the HRD Minority-Serving Portfolio and Avenues for Future Discourse

In addition to the retrospective appraisal of program performance and administration addressed elsewhere, the 2007 Committee of Visitors for HRD's portfolio of minority-serving programs affords the opportunity for us to think collectively about many higher-order academic issues. Beyond administration and stewardship of the HRD constituents, what considerations are of importance to other recipients of NSF funding and the nation in general? How might these broader themes be implemented in the Division, NSF-wide and beyond? At the request of the Assistant Director for Education and Human Resources and the COV Chair we invite your thoughts on the following thematic areas.

C.6 How can the expertise and benefits realized by the efforts of HRD programs be infused across NSF, not just among directorates and programs but to the areas where discipline-specific inequities in broadening participation persist?

Most importantly, NSF must make sure that all of the NSF programs are aligned to NSF's overall goals and objectives, including those that further the participation of underrepresented groups in STEM fields. Furthermore, it must be stressed to NSF staff in the other programs that they, as individuals, must also be aligned to these goals and objectives, and all must understand that this is critical to the success of NSF as a whole. The different units of NSF should be working together on these goals and objectives, and never view the different ones as being in competition.

C.7 What role can HRD's programs serve in broadening and deepening STEM issues of importance to all Americans, including the public understanding and appreciation of science and engineering?

Dissemination is critical. Within the limits we know are placed on the organization, this subpanel feels strongly that there should be a deliberate and intentional "media blitz" let by the participating institutions to get the word out on the excellent work that is being done through this program.

C.8 In light of the American Competitiveness Initiative (ACI), "Rising Above the Gathering Storm" and other reports, how can successes in broadening participation in academe better inform the production of qualified personnel and outputs in the broader national workforce?

Further metrics have to be developed to assess the short- and long-term impact of these projects. Metrics that can focus the attention of the public and inform them on the possibilities for success in this area are particularly important. The publication "HBCU-UP Academic Indicator Report 2005" is a good start, but, for example, there is not currently a strong enough relationship between NSF and industry to assure a good dissemination of the report there. Further conversations between directors of funded projects, and insights from them on how to get the word out, could also help. NSF could also further engage and partner with marketing and information dissemination arms of funded institutions to help with this effort.

C.9 What more can HRD's portfolio do to engage a broader community of applicants, in particular institutions that serve minority STEM students but which are themselves underrepresented in receiving NSF funding for research and education?

HRD could be more open to the idea that non-STEM disciplines can help achieve the objectives of HRD through partnerships with STEM disciplines, or efforts of their own that focus on the elements that lead ultimately to success in STEM. This may mean consideration of proposals that do not fit into the "box" of a particular solicitation, but HRD could send the message that creative proposals in such a direction will get a careful reading and consideration.

C.10 In what way are lengthier projects (i.e., those longer than 3-4 years) held accountable for continued funding, as via formative evaluations and other kinds of evaluation?

This is an area in which improvement could occur. Projects should establish not just timelines, but critical milestones that must be achieved before the project is considered on track. Care must be taken not to discourage projects with some risk that might mean that the milestones are not guaranteed, but in that case it should be clear that something has been learned from that, and not just that the project slipped for reasons that could have been avoided.

C.11 How are examples of "What Works" captured in the course of reviewing the portfolio's activities? How are these exemplars disseminated or used to inform broader, more integrated approaches in support of the program's goals?

As mentioned already in this report, the “HBCU-UP Academic Indicator Report 2005” has been useful in capturing the portfolio’s activities. Broader dissemination of this document could help get the word out and be useful to others in informing their activities.

C.12 Appreciating that ethnicity/gender/disability status may be under-reported by PIs and reviewers alike, what efforts are being made to ensure the broadest solicitation, application and utility of this program’s awards and the outputs derived from them?

NSF needs to remain closely in contact with the people already working in this area, who can also help identify further people who could be brought into this effort. They should also continue to build on the large amount of data they already have for this, and could also take a more market-oriented approach to discovering who is not being reached by their efforts and how to bring them into the fold.

SIGNATURE BLOCK:

_____

For the HBCU-Undergraduate Program
Dr. Robert Megginson, Sub Panel Chair
Dr. Willie Pearson, Jr.
Chair, HRD Bundled COV

FY 2007 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: September 27 – 28, 2007
Program/Cluster/Section: CREST
Division: HRD
Directorate: E&HR
Number of actions reviewed: Awards: 19 Declinations: 10 Other:
Total number of actions within Program/Cluster/Division during period under review:145 Awards: 16 Declinations: Other:
Manner in which reviewed actions were selected: By NSF staff. Random with stratification to achieve a balanced number of actions (proposals awarded and declined, amendments, supplements)

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 three fiscal years*. Provide comments for *each* program being reviewed and 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 procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[22]
1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments: The sub-panel urges NSF to strive to increase the representation of panel reviewers with experience in specific technical topics relevant to the proposals under review. The HRD program officers should continue their engagement of officers in other divisions to achieve this aim.	Yes

[22] If "Not Applicable" please explain why in the "Comments" section.

2. Is the review process efficient and effective? Comments: The review process appears to be efficient, and the program officers have done well meeting the challenge of assembling panels for sets of proposals with such diverse interests. The reviews overall provide sufficient feedback to the PIs for improvement of future submissions.	Yes
3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? Comments: See above.	Yes
4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation? Comments: The sub-panel viewed the panel summaries as constructive overall and representative of the individual reviews. The sub-panel understands that PIs receive a complete set of reviews, but the sub-panel did not have electronic access to all reviews. As such, it had difficulty assessing whether the PIs were receiving sufficient feedback about the technical portions of the proposals.	Yes
5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation? Comments: Overall, yes for proposal decisions, but amendments would benefit from documents in the file that explain the nature of the amendment and the original associated award. The sub-panel found one example in which the program officer's review analysis was somewhat inconsistent with the panel summary and reviews, as it did not convey the most substantial deficiency. The funding decision was consistent with the reviews, however.	Yes
6. Is the time to decision appropriate? Comments:	Yes

7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[23]
1. Have the individual reviews (either mail or panel) addressed both merit review criteria? Comments: The sub-panel found that both merit and review criteria were addressed.	Yes
2. Have the panel summaries addressed both merit review criteria? Comments: The sub-panel spent quite a lot of time on this and agreed that the panel summaries were generally clear on these criteria. In cases of panel member ratings of a wide range, the summaries should take more care in conclusions.	Yes
3. Have the *review analyses* (Form 7s) addressed both merit review criteria? Comments: These also were generally clear.	Yes
4. Additional comments with respect to implementation of NSF's merit review criteria:	

[23] In "Not Applicable" please explain why in the "Comments" section.

A.3 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	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[24]
1. Did the program make use of an adequate number of reviewers? Comments: The sub-panel concluded that overall the number of reviewers appears appropriate, but as noted above, it urges NSF to strive to increase the representation of panel reviewers with experience in specific technical topics relevant to the proposals under review. The HRD program officers should continue their engagement of officers in other divisions to achieve this aim.	Yes
2. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: The reviewers appear to be represented well by individuals from minority-serving institutions, but as mentioned above the sub-panel felt the review process would benefit greatly from increased representation of reviewers having specific technical expertise relevant to the science and engineering aims of the proposals.	Yes
3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[25] Comments: The panel did not thoroughly analyze geographic distribution of the reviewers, but it did not detect any unusual trends. With respect to the type of institution, minority-serving institutions seemed to dominate the review committees. As mentioned above, it would benefit the program to draw more reviewers with specific technical expertise relevant to the topics, and it seems likely these could be drawn from prominent research universities. Because the CREST involves centers, a logical source of technical reviewers would be science and engineering research centers in other NSF divisions and directorates. In doing so, stronger bridges can be built between minority serving institutions and prominent research institutions.	Yes
4. Did the program recognize and resolve conflicts of interest when appropriate? Comments: The sub-panel detected one event that could have been perceived as a conflict of interest, but NSF indicated that measures were taken to prevent this in the future.	Yes

[24] If "Not Applicable" please explain why in the "Comments" section.
[25] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

5. Additional comments on reviewer selection:	

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[26], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. Comments: Based on the sample of actions examined, the program is supporting CREST and HBCU-RISE education and human resource development activities of high quality with good management and assessment plans. The research activities supported by the program are good and although the sub-panel recognized that all the research projects supported may not be nationally competitive, the program appears to be supporting research in which clear goals are articulated and will serve as a mechanism to raise the quality of research at the funded institutions. Conversely, of the sample of actions reviewed, the award declinations appear to be well justified by the reviews and panel summaries, as these cases indicated weakness in the quality of either research, education, or both.	Appropriate
2. Are awards appropriate in size and duration for the scope of the projects? Comments: The sub-panel felt that the annual increment of $1,000,000 for a CREST was too small for operation of a multifaceted center that is attempting to develop research and education in a complex environment. Therefore, it recommends that NSF considers increasing the amounts of the awards. The ten-year limit on CRESTs is appropriate, although the sub-panel thought a slightly longer term would permit many centers to achieve their aims thoroughly, and it recommends that NSF consider increasing the limit for CRESTs to 12 years, with a 6+6 format. Given the aims of the program, the panel thought the mandatory phase out of CRESTs (after 12 years) was appropriate. The program also should continue to emphasize the use of RISE grants as "seed" funds to position the HBCUs for the CREST competition. The sub-panel regarded the three-year term for HBCU-RISE grants as appropriate. The sub-panel was impressed by the mechanism implemented for awarding supplements, in which the program officer requests proposals from existing awardees on an annual basis and then distributes supplements based on merit within the constraints of a known budget.	Not Appropriate
3. Does the program portfolio have an appropriate balance of: • Innovative/high-risk projects?[27]	Appropriate

[26] If "Not Appropriate" please explain why in the "Comments" section.

Comments:	
4. Does the program portfolio have an appropriate balance of: • Multidisciplinary projects? Comments: The sub-panel felt that within each CREST there was an appropriate balance of multidisciplinary projects.	Appropriate
5. Does the program portfolio have an appropriate balance of: • Funding for centers, groups and awards to individuals? Comments: The CREST and HBCU-RISE programs do not make awards to individuals. The balance of awards to Centers (CREST) and groups (HBCU-RISE) is appropriate.	Appropriate
6. Does the program portfolio have an appropriate balance of: • Awards to new investigators? Comments: There are a number of what looks like new investigators. The quality of the program must be maintained and even enhanced. New investigators need to step up to the task of generating research and more participation.	Appropriate
7. Does the program portfolio have an appropriate balance of: • Geographical distribution of Principal Investigators? Comments: Given where the centroid of HBCUs/MIs are located, the geographical distribution is very well-balanced	Appropriate
8. Does the program portfolio have an appropriate balance of: • Institutional types? Comments: It appears that each type of institution is represented.	Appropriate
9. Does the program portfolio have an appropriate balance of: • Projects that integrate research and education? Comments: The criteria for CREST and HBCU-RISE awards is integration of research and education, and the funded projects achieve this aim in an appropriate manner.	Appropriate*
10. Does the program portfolio have an appropriate balance: • Across disciplines and subdisciplines of the activity and of emerging opportunities? Comments: Science as well as technology are represented.	Appropriate

[27] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

11. Does the program portfolio have appropriate participation of underrepresented groups? Comments: Certainly, the institutions being awarded have large populations of underrepresented persons. It appears that the Centers themselves have such participation; however, it was not completely clear to the sub-panel as to the percentages at times.	Appropriate
12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports. Comments: The CREST program in particular has had much success over the years of producing research, graduating students, and building careers.	Appropriate
13. Additional comments on the quality of the projects or the balance of the portfolio:	

A.5 Management of the program under review. Please comment on:

1. Management of the program. Comments: The sub-panel felt the program management was commendable, particularly given the apparent low-level of staffing and the absence of permanent staff. The sub-panel urges the NSF to consider mechanisms that reduce turnover of personnel and improve retention of institutional memory, which it regards as critical for proper management of CREST and HBCU-RISE. The absence of a permanent program officer can create obstacles to communication between CREST and RISE awardees, which can be particularly problematic for minority-serving institutions attempting to develop research and education infrastructure. The sub-panel felt the optimum configuration for management would be one permanent program officer and an IPA (rotator).
2. Responsiveness of the program to emerging research and education opportunities. Comments: The annual request for proposals naturally allows the program to respond to emerging opportunities. The absence of a permanent program officer, however, can reduce the

responsiveness of the program due to the need of an IPA to move up the “learning curve.”
3. Program planning and prioritization process (internal and external) that guided the development of the portfolio. Comments: The program has performed admirably in its implementation and management of CREST and HBCU-RISE, developing a balanced portfolio of CREST and HBCU-RISE grants distributed over an appropriate cross-section of institutions. The sub-panel thought the development of the RISE program was particularly commendable.
4. Additional comments on program management:

PART B. RESULTS OF NSF INVESTMENTS

The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio. Since relevant aspects of the Stewardship goal are included in Part A, the COV is not asked to respond to that goal in Part B.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions[28].

B.1 OUTCOME GOAL for Discovery: "*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*

Comments: The CREST and HBCU-RISE awardees have been very productive with respect to publications and patents, with many boasting more than 50 publications acknowledging CREST support, and some touting extraordinary output (Florida International University, PI: Deng, HRD-0317692,180 publications; Fisk University, PI: Collins, HRD-0420516, 80 publications; Jackson State University, PI: Leszczynski; HRD-0318519, 412 research papers, 16 books, 500 presentations, 3000 citations, 48 invited). Many CRESTs also have contributed book chapters and have patents pending or issued. A particularly noteworthy contribution to the knowledge base came from Tennessee State University (PI: Keel, HRD-0206028), which discovered a new transiting planet around a distant star.

Many of the CRESTs have become recognized leaders in their disciplines, as evidenced by leveraged support from other sources, which also fulfills the expectation of sustainability. Particularly notable are (1) CUNY City College (PI: Watkins; HRD-0206162), which has leveraged $4.3 million in non-CREST funding; (2) Tuskegee (PI: Jeelani; HRD-0317741), which is involved with several research efforts funded through DoD and NASA, and is supported by General Motors, Raytheon,

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and Boeing; (3) Florida International University (PI: Deng; HRD-0317692), which has leveraged more than $5.3 million in new research awards and $4 million in in-kind equipment contributions; (4) Texas A&M, Kingsville (PI: John; HRD-0206259), which has leveraged more than $2.5 million in external sponsored grants.

The sub-panel noted that, at least CCNY, had a previous CREST.

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.*"

Comments: The institutions in the CREST/HBCU-RISE program collectively are making substantial advances toward cultivating and contributing a large number of emerging scientists and engineers drawn from groups traditionally underrepresented in these fields. This is supported by the annual division report highlights, which reveal a large number of students involved in research at the awardee institutions. As such, they certainly are achieving the aim of cultivating a broadly inclusive workforce for science and engineering as whole. The sub-panel urges the program to continue encouraging the research training of undergraduates at HBCUs and minority-serving institutions, as these students represent a large reservoir of potential talent for the science and engineering workforce. The sub-panel also urges NSF to encourage outreach activities by their awardees that increase the awareness of science and engineering within their institutions as well as among the public in the communities directly served by the institutions. One way to encourage innovative outreach activities beyond the original scope of the proposal would be through supplements earmarked from this purpose.

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.*"

Comments: The contributions of the program to research infrastructure are stellar, funding laboratory renovation and installation of new equipment at institutions where these investments have had a high impact. For example, Clark-Atlanta University (PI: Aliabadi; HRD-0401679) established an advanced graduate computing laboratory. Alabama A&M (PI: Lal; HRD-0236425) installed major equipment including x-ray diffraction systems, SEM, FT-IR to support materials research efforts. The CREST program has also been instrumental in the development of new technologies (for example, sensor technology at California State University Los Angeles; PI: Robles; HRD-0317772).

The sub-panel noted that Clark-Atlanta and Alabama A&M had previous CREST awards.

B.4 OUTCOME GOAL for Stewardship:" *Support excellence in science and engineering research and education through a capable and responsive organization.*"

Comments: Not applicable as per instructions.

PART C. OTHER TOPICS

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The Sub-panel commends HRD on managing the CREST and HBCU-RISE programs.

No serious improvements needed of gaps identified. Minor issues are addressed above.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

No further comments necessary.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

The sub-panel urges NSF to strive to increase the representation of panel reviewers with experience in specific technical topics relevant to the proposals under review. The HRD program officers should continue their engagement of officers in other divisions to achieve this aim.

C.4 Please provide comments on any other issues the COV feels are relevant.

The sub-panel requests HRD program officers to encourage CREST awardees, in particular, to partner with smaller HCBUs to help faculty there develop stronger research experience and infrastructure. At the same time, the sub-panel suggests that CREST awardees continue to partner with research and technology center awardees of the different NSF directorates – in doing so, the CREST staff will benefit from major research ! university/faculty experience.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

Some questions were ambiguous. The files available electronically need to be comprehensive. The panel felt the process could have been improved by reducing the number of prescribed question in the template while retaining the content germane to the most important issues.

Broader Perspectives on the HRD Minority-Serving Portfolio and Avenues for Future Discourse

In addition to the retrospective appraisal of program performance and administration addressed elsewhere, the 2007 Committee of Visitors for HRD's portfolio of minority-serving programs affords the opportunity for us to think collectively about many higher-order academic issues. Beyond administration and stewardship of the HRD constituents, what

considerations are of importance to other recipients of NSF funding and the nation in general? How might these broader themes be implemented in the Division, NSF-wide and beyond? At the request of the Assistant Director for Education and Human Resources and the COV Chair we invite your thoughts on the following thematic areas.

C.6 How can the expertise and benefits realized by the efforts of HRD programs be infused across NSF, not just among directorates and programs but to the areas where discipline-specific inequities in broadening participation persist?

The sub-panel commends the NSF for instilling a spirit of education and outreach across all divisions, and it felt that the NSF should consider mechanism that enable HRD to cooperate more extensively with other divisions and directorates to improve the proposal and award process, with the ultimate goal of improving the scientific outcomes as well as broadening participation in STEM. For example, HRD can assist in the development of program announcements in other divisions that contain specific broader impact requirements, or it can assist in the evaluation of human resource development content contained within broader impact components of proposals submitted to other divisions. Separate evaluations of the scientific and broader impact components of such proposals may serve to improve both.

C.7 What role can HRD's programs serve in broadening and deepening STEM issues of importance to all Americans, including the public understanding and appreciation of science and engineering?

See above.

C.8 In light of the American Competitiveness Initiative (ACI), "Rising Above the Gathering Storm" and other reports, how can successes in broadening participation in academe better inform the production of qualified personnel and outputs in the broader national workforce?

C.9 What more can HRD's portfolio do to engage a broader community of applicants, in particular institutions that serve minority STEM students but which are themselves underrepresented in receiving NSF funding for research and education?

C.10 In what way are lengthier projects (i.e., those longer than 3-4 years) held accountable for continued funding, as via formative evaluations and other kinds of evaluation?

The program has a robust and working system in place.

C.11 How are examples of "What Works" captured in the course of reviewing the portfolio's activities? How are these exemplars disseminated or used to inform broader, more integrated approaches in support of the program's goals?

C.12 Appreciating that ethnicity/gender/disability status may be under-reported by PIs and reviewers alike, what efforts are being made to ensure the broadest solicitation, application and utility of this program's awards and the outputs derived from them?

SIGNATURE BLOCK:

_____

For the HRD COV sub-panel for CREST and HBCU-RISE
Dr. Warren W. Buck, Sub Panel Chair
Dr. Willie Pearson, Jr.,
Chair, HRD Bundled COV

FY 2007 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: September 27-28, 2007
Program/Cluster/Section: AGEP
Division: Human Resource Development
Directorate: Education and Human Resources
Number of actions reviewed: Awards: 18 Declinations: 4 Other:
Total number of actions within Program/Cluster/Division during period under review: Awards: 62 Declinations: 18 Other: 1
Manner in which reviewed actions were selected: **Random stratification sample.**

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 three fiscal years*. Provide comments for *each* program being reviewed and 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 procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[29]
1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits) Comments: Panels are used and appear to be gender balanced. There appears to be representation from MSI and majority institutions. There is no specific information on ad-hoc reviewers and no evidence of site visits being part of the review or management process.	Yes

[29] If "Not Applicable" please explain why in the "Comments" section.

2. Is the review process efficient and effective? Comments: This is a program that depends on description of partnerships that are critical to success and outcomes. Site visits could be helpful in determining the nature and viability of such partnerships and enhance the review process.	Yes
3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? Comments: The mechanism is in theory appropriate but is uneven in its implementation. The level of detail in the individual and summary reviews varied dramatically. Most summary reviews tended to be more complete (5 out of 6 proposals), though in one case the summary reviews did not reflect pertinent observations made in the individual reviews.	Yes
4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation? Comments: Some are detailed and potentially helpful while some others lacked information and were not reflective of some of the individual reviews both positive and negative. Additionally, there were instances where summary reviews appeared to be much more expansive than the collective individual reviews and also appeared to be inconsistent with the levels of enthusiasm reflected in the ratings.	No
5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation? Comments: Information present in the documentation provided to the committee.	Yes
6. Is the time to decision appropriate? Comments:	Yes

Time of decision appropriate according to the NSF benchmark.	

7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:

The lack of uniformity in the reviews would necessitate more structured instructions for reviewers. Many reviews did not include any information as to evaluation or the administration of the program. Instead, they focused on anecdotal trends and ancillary issues not directly related to the success of the program. Overall evaluation designation (fair, good, outstanding, etc.), while found on Form 7 were rarely found in the individual reviews.

There was also tremendous variation in the level of detail and usefulness of the review summaries. They varied from single sentence declarations, to bulleted words, to detailed analysis for both funded and declined proposals.

Although there appears to be instructions detailing the reviews and review summaries, compliance seems to be uneven.

*The information provided for the review procedures and process was not sufficient to address some issues such as ad hoc members, Program Officer comments and trends (longitudinal data).

A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[30]
1. Have the individual reviews (either mail or panel) addressed both merit review criteria? Comments: The reviews are inconsistent in nature and level of content. Some are of high quality and adequately address merit and broader impact while others lack helpful information.	No
2. Have the panel summaries addressed both merit review criteria? Comments: Some lack sufficient detail.	No
3. Have the *review analyses* (Form 7s) addressed both merit review criteria? Comments:	Yes

[30] In "Not Applicable" please explain why in the "Comments" section.

4. Additional comments with respect to implementation of NSF's merit review criteria:

The review criteria are addressed, but there is some question as to the substance and relevance of the content of some of the reviews in relation to the criteria.

A.3 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	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[31]
1. Did the program make use of an adequate number of reviewers? Comments: All the proposals reviewed in the set provide to the committee had written reviews from three reviewers. However, In one set a reviewer did not write anything. An expansion of the number of written reviews could address the question of sufficient reviews especially in light of the unevenness in the quality of the reviews.	Yes
2. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: From data supplied in Form 7, it appears that they were appropriately chosen.	Yes
3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[32] Comments: Underrepresented group data was not made available to the COV. There appears to be good geographical distribution.	Yes
5. Additional comments on reviewer selection:	

[31] If "Not Applicable" please explain why in the "Comments" section.
[32] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

A.4 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[33], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. Comments: While the overall quality of supported programs seemed good, the current COV process did not allow for the detailed review of the funded proposals and reports to definitively answer this question.	Appropriate
2. Are awards appropriate in size and duration for the scope of the projects? Comments: The budget appears modest when the overall objective and potential impact of the program is considered. The duration of the award is appropriate.	Appropriate
3. Does the program portfolio have an appropriate balance of: • Innovative/high-risk projects?[34] Comments: Whereas some of the approaches appear to be innovative, there is little incentive for risk based on the limited funding of the program. The program has made decisions that have demonstrated high risk with the promise of greater impact. Examples include the Northeast Alliance and the North Carolina Alliance. The limited success of the Northeast Alliance was countered by a massive reorganization and expansion to form a solid regional institutional group that created the potential for a major impact and won a renewal award. The North Carolina Alliance employed an innovative collaborative proposal that had member institutions submit independent applications that reflected functional integration with independence in management. This has been a strength in that Alliance that reinforced equality among participating institutions.	Appropriate

[33] If "Not Appropriate" please explain why in the "Comments" section.
[34] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

4. Does the program portfolio have an appropriate balance of: • Multidisciplinary projects? Comments: Yes	Appropriate
5. Does the program portfolio have an appropriate balance of: • Funding for centers, groups and awards to individuals? Comments: These are institutional partnership grants and to our best understanding, do not fund centers and individuals.	Not applicable
6. Does the program portfolio have an appropriate balance of: • Awards to new investigators? Comments: These are institutional partnership grants and to our best understanding, do not fund centers and individuals.	Not applicable
7. Does the program portfolio have an appropriate balance of: • Geographical distribution of Principal Investigators? Comments: Yes. The 2007 AGEP Magazine was very helpful in showing this.	Appropriate
8. Does the program portfolio have an appropriate balance of: • Institutional types? Comments: This is inherent in the structure of the program	Appropriate
9. Does the program portfolio have an appropriate balance of: • Projects that integrate research and education? Comments: This is one of the stronger features of the program.	Appropriate
10. Does the program portfolio have an appropriate balance: • Across disciplines and subdisciplines of the activity and of emerging opportunities? Comments: Yes	Appropriate

11. Does the program portfolio have appropriate participation of underrepresented groups? Comments: Yes	Appropriate
12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports. Comments: These issues were more than adequately addressed in the three “Info Brief” publications, produced by the AAAS in January of 2007.	Appropriate
13. Additional comments on the quality of the projects or the balance of the portfolio:	

A.5 Management of the program under review. Please comment on:

1. Management of the program. Comments: Management appears to be limited to be one person, which is difficult for a program of this scope based on the number and geographical distribution of participating institutions which has increased dramatically over the last six years.
2. Responsiveness of the program to emerging research and education opportunities. Comments: Many of the institutions represented are conducting cutting edge research in their graduate programs. The emphases on alliances and multidisciplinary components (all STEM disciplines) over the last six years have increased the potential impact of the program.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments: The program has been actively evolving in response to the needs and capacity of its participating institutions. These have included undergraduate, post doctoral and faculty components.

4. Additional comments on program management:

The program is managed well. This is especially commendable based on its evident impact in light of very limited funding. However, based on the data provided in the three AAAS Info Briefs, the IBP Booklet, as well as conversations with Roosevelt Johnson that AGEP accomplishments may have been overstated: Examples:

a.. "We have proven the viability of new paradigms for improving graduate education." From discussions with Dr. Johnson's and his "Message" in the 2007 AGEP Magazine, we felt that this was a stretch considering that the program has only been in existents for 9 years and that there has been at least 3 iterations (MGE's in 1998 competition, variety of formats including loose alliances in the 2000 competition, and a tight alliances model in the 2004 competition)

b. The Summary in each of the three January, 2007 Info Briefs state "One of the goals of the NSF AGEP Program...is to increase the number of URM students pursuing (and receiving) advanced degree's in STEM. Analyses of graduate student enrollee data (or PhD awarded data) from AGEP institutions indicate that the AGEP Program is achieving this goal." The data presented in all three reports only gives the results from AGEP institutions, but does not include results from non-AGEP schools, so it is not possible to determine if AGEP is a determining factor or merely reflecting national trends.

Even with this caveat the AGEP sub-panel believes that the PD and NSF have done a very good job in leveraging the AGEP's relatively limited funding and that this program has had a very positive effect nationally on achieving the originally stated program goals. Given its apparent successes, AGAP is a program that could significantly benefit from a higher budget.

PART B. RESULTS OF NSF INVESTMENTS

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The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio. Since relevant aspects of the Stewardship goal are included in Part A, the COV is not asked to respond to that goal in Part B.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions[35].

B.1 OUTCOME GOAL for Discovery: "*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*

Comments:

Projections from the 2000 US census predict that by 2040, the majority population of the country will be URM. The AGEP program addresses critical areas in the pipeline that are necessary to extend this demographic shift to the scientific workforce. Evaluation data appears to reflect significant increases in applications, enrollment and graduation of students from AGEP institutions. Individual AGEP program accomplishments are well described the 2007 AGEP Magazine produced by The University of Alabama – Birmingham and in the AAAS "Info Brief" publications of January 2007.

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens."*

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Comments:
As the AGEP programs have evolved, there has been a dramatic increase in the number of participating institutions (both Research 1 and MSI). This has increased the number of URM (at all academic levels) that are enrolled, graduating and faculty at these institutions. This has effectively broadened the numbers of URMs that have gained cutting edge skills in STEM related fields (2007 AAAS reports), and thus have expanded the influence of the AGEP program on the growth the STEM workforce.
The University of California AGEP (Sheila O'Rourke, PI) has been particularly impressive in their outcomes data. The Alabama AGEP (Louis Dale, PI) should also be lauded for their involvement in the publication of the 2007 AGEP Magazine, which is a wonderful PR piece for all AGEP programs

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools."*

Comments:

Although there is no direct support for research infrastructure from the AGEP program. However, the formation of Alliances has created access to advances instrumentation and infrastructure to partner institutions that otherwise would not have this access. This has resulted in a broadening of training opportunities. The Northeast Alliance AGAP (Sandra Petersen, PI) is a particularly interesting model as is the University of California AGEP (Sheila O'Rourke, PI).

B.4 OUTCOME GOAL for Stewardship:" *Support excellence in science and engineering research and education through a capable and responsive organization."*

Comments:

The quality of some of the successful competitive renewal application demonstrates that there has been proper stewardship of funds. Examples include the University of California system whereby an initial award to three institutions was leveraged whereby the initial awardees reduced their budgets to accommodate an expansion of institutions. The renewal application facilitated an internal peer review process that matched individual institutional budget requests with AGEP priorities. This AGEP has been extremely effective in increasing the number of participants and graduates. The new organizational structure should further enhance the growth (Sheila O'Rourke, PI) .

Another example is the University of Colorado AGEP (Susan Avery, PI) that has demonstrated high productivity and expansion of the scope of the program within the confines of an initial award. It is notable that this expansion was facilitated by a 1:1 match to the awarded funds by the institution when such matching was not a requirement.

PART C. OTHER TOPICS

C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

1. Incorporate site visits as a valued component for the review process, especially for renewal applications.
2. Increase budget to facilitate expansion of programs and program management
3. Include proper controls in programmatic assessment (see A.5.4)
4. Pursue active partnering with other agencies and foundations to promote synergy and remove repetition.
5. Include provisions (plans) to increase capacity for quality training at MSI partner institutions. These schools must get more out of the program than the satisfaction of sending their students to Alliance institutions.

C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

From a review of the program portfolio, it appears that the program is meeting its goals. A more rigorous analysis of outcomes with proper controls (see A.5.4), would provide better quantitative assessment upon which to determine if the program is achieving its goals and objectives.

C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

1. Increase budget and staff for COV reviewed NSF programs.
2.Encourage schools with multiple NSF programs to coordinate resources, promote synergy and cross fertilization, and limit duplicative administrative costs.
3. With C.3.2 in mind, it is recommended that when LSAMP's Bridges to the Doctorate and AGEP programs are on the same campus, that the AGEP program administer the Bridges program. The rationale for this suggestion is based on the different populations that LSAMP (undergraduates) and AGEP (doctoral students, postdoctoral fellows and early stage faculty) programs are direct at.
4.It is also recommended that NSF review the validity of funding levels for Bridges program students. There seems to be disconnect of funding M.S. students at a higher level (30K) than doctoral students at most campuses. Bridge's-like post baccalaureate programs, with more appropriate stipend levels (20 -25 K), at AGEP institutions may offer a better mechanism for insuring entrance into doctoral programs.

C.4 Please provide comments on any other issues the COV feels are relevant.

See above comments.

C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.

1. Provide proposals in review portfolio for reading prior to the meeting of the committee

2. Provide concise and targeted instructions (related to process) as to the aims of the COV and the efficient mechanism for the review.
3. A meeting (dinner) the night before the formal process begins where the sub-panel members get to meet each other as well as receive an orientation from the PD would be extremely helpful.
4. Make the pre meeting presentations more relevant to the process.
5. Electronic Jackets should be complete with all related document s (reviews, proposal etc) with full proposals available within supplementary links.
7. A clear distinction of the relevance, or weight, of each of the two review criteria (intellectual merit and broader impact) should be given per program. This will facilitate the COV in reviewing the emphasis and significance of the contents provided by the proposal reviewers.
8. Successful programs (or best practices) should be shared.

Broader Perspectives on the HRD Minority-Serving Portfolio and Avenues for Future Discourse

In addition to the retrospective appraisal of program performance and administration addressed elsewhere, the 2007 Committee of Visitors for HRD's portfolio of minority-serving programs affords the opportunity for us to think collectively about many higher-order academic issues. Beyond administration and stewardship of the HRD constituents, what considerations are of importance to other recipients of NSF funding and the nation in general? How might these broader themes be implemented in the Division, NSF-wide and beyond? At the request of the Assistant Director for Education and Human Resources and the COV Chair we invite your thoughts on the following thematic areas.

C.6 How can the expertise and benefits realized by the efforts of HRD programs be infused across NSF, not just among directorates and programs but to the areas where discipline-specific inequities in broadening participation persist?

Encourage, or increase, cross-directorate and cross-program communication and support.

C.7 What role can HRD's programs serve in broadening and deepening STEM issues of importance to all Americans, including the public understanding and appreciation of science and engineering?

There should be formalized public relations program established. The publications that outline or describe the various inter-directorate programs should be widely disseminated (e.g., a special segment of the NSF website dedicated to such content and/or by emails to appropriate individuals/groups nationally).

C.8 In light of the American Competitiveness Initiative (ACI), "Rising Above the Gathering Storm" and other reports, how can successes in broadening participation in academe better inform the production of qualified personnel and outputs in the broader national workforce?

No Comment.

C.9 What more can HRD's portfolio do to engage a broader community of applicants, in particular institutions that serve minority STEM students but which are themselves underrepresented in receiving NSF funding for research and education?

Encourage applicants to include such institutions (MSIs that do not usually receive funding) in their applications. NSF needs to promote or advertise its HRD programs for the awareness and broadening the community of applicants to include such institutions. Partnering with other agencies (government and/or private foundations) like Sloan and HHMI will be helpful.

C.10 In what way are lengthier projects (i.e., those longer than 3-4 years) held accountable for continued funding, as via formative evaluations and other kinds of evaluation?

No comment.

C.11 How are examples of "What Works" captured in the course of reviewing the portfolio's activities? How are these exemplars disseminated or used to inform broader, more integrated approaches in support of the program's goals?

Possibly through publications and national annual conferences, e.g., the 2007 AGEP Magazine produced by The University of Alabama – Birmingham.

C.12 Appreciating that ethnicity/gender/disability status may be under-reported by PIs and reviewers alike, what efforts are being made to ensure the broadest solicitation, application and utility of this program's awards and the outputs derived from them?

All NSF funded program annual reports should include the breakdown of such data.

SIGNATURE BLOCK:

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