CORE QUESTIONS and REPORT TEMPLATE
for
FY 2015 NSF COMMITTEE OF VISITOR (COV) REVIEWS

Guidance to NSF Staff: This document includes the FY 2015 set of Core Questions and the COV Report Template for use by NSF staff when preparing and conducting COVs during FY 2015. Specific guidance for NSF staff describing the COV review process is described in the "COV Reviews" section of NSF's Administrative Policies and Procedures which can be obtained at https://inside.nsf.gov/aboutnsf/hownsfworks/rolesresponsibilities/Pages/Committee-of-Visitors.aspx [1].

NSF relies on the judgment of external experts to maintain high standards of program management, to provide advice for continuous improvement of NSF performance, and to ensure openness to the research and education community served by the Foundation. Committee of Visitor (COV) reviews provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and (2) managerial matters pertaining to proposal decisions.

The program(s) under review may include several sub-activities as well as NSF-wide activities. The directorate or division may instruct the COV to provide answers addressing a cluster or group of programs – a portfolio of activities integrated as a whole – or to provide answers specific to the sub-activities of the program, with the latter requiring more time but providing more detailed information.

The Division or Directorate may choose to add questions relevant to the activities under review. NSF staff should work with the COV members in advance of the meeting to provide them with the report template, organized background materials, and to identify questions/goals that apply to the program(s) under review.

Suggested sources of information for COVs to consider are provided for each item. As indicated, a resource for NSF staff preparing data for COVs is the Enterprise Information System (EIS) –Web COV module, which can be accessed by NSF staff only at http://budg-eis-01/eisportal/default.aspx. In addition, NSF staff preparing for the COV should consider other sources of information, as appropriate for the programs under review.

For programs using section IV (addressing portfolio balance), the program should provide the COV with a statement of the program's portfolio goals and ask specific questions about the program under review. Some suggestions regarding portfolio dimensions are given on the template. These suggestions will not be appropriate for all programs.

Guidance to the COV: The COV report should provide a balanced assessment of NSF's performance in the integrity and efficiency of the ***processes*** related to proposal review. Discussions leading to answers of the Core Questions will require study of confidential material such as declined proposals and reviewer comments. ***COV reports should not contain confidential material or specific information about declined proposals.*** The reports generated by COVs are made available to the public.

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

[1] The COV Reviews section has three parts: (1) Policy, (2) Procedures, and (3) Roles & Responsibilities.

FY 2015 REPORT TEMPLATE FOR NSF COMMITTEES OF VISITORS (COVs)

Date of COV:
June 22-23, 2015

Program/Cluster/Section:
Advanced Technological Education (ATE) Program

Division:
Division of Undergraduate Education (DUE)

Directorate:
Directorate for Education and Human Resources (EHR)

Number of actions reviewed:

Awards: 40

Declinations: 62

Other: 0

Total number of actions within Program/Cluster/Division during period under review:

Awards: 188

Declinations: 546

Other: 0

Manner in which reviewed actions were selected:

Committees of Visitors (COVs) review a random selection of program awards and declines. To assure the randomness of the selection, the COV Chair, Mr. Muhammed Chaudhry, was asked by ATE staff to provide three one-digit numbers from zero to nine; he chose 7, 8, and 6. Thus every new proposal funded in the ATE program in FY2012 to FY2014 whose identification number ends in 7, 8, and 6 is presented in a list. Due to the large number of proposals, only declines ending in 7 were selected (a collaborative project was selected if any one of the collaborative IDs ended in 7). These lists of proposals are given as a suggestion of proposals and awards to be looked at by the committee; however, the committee is welcome to request to see any proposal or award handled during fiscal years 2012-2014.

COV Membership

	Name	**Affiliation**
COV Chair:	Mr. Muhammed Chaudhry	Silicon Valley Education Foundation
COV Members:	Dr. Peirce Hammond Ms. Patricia Godin Healy Dr. James McKenney Dr. Brian Smith	U.S. Department of Education (retired) Wake Technical Community College American Association of Community Colleges Drexel University

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(s) under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

I. Questions about the quality and effectiveness of the program's use of merit review process. Please answer the following questions about the effectiveness of the merit review process and provide comments or concerns in the space below the question**.**

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE
1. Are the review methods (for example, panel, ad hoc, site visits) appropriate? Comments: The review methods used with the selected group of proposals assigned to the COV were appropriate. ATE review methods included panel and ad hoc reviews. Site visits were generally only used as a review method for proposals concerning national centers. The group of proposals reviewed by the COV did not contain any site visit reports. **Data Source: Jackets and COV Documents (Section 3)**	YES

2. Are both merit review criteria addressed a) In individual reviews? b) In panel summaries? c) In Program Officer review analyses? Comments: Based on the review of selected proposals, reviews address both merit criteria. Individual reviews generally addressed the merit review criteria effectively, and the panel chairs provided a substantive level of comments. NSF contacted Principal Investigators (PIs) as needed to answer questions on key proposal elements (e.g., budget or evaluation) or to re-quantify the category costs of the grant if they seemed out of balance or exceeded the cap on ATE grants. Program Officer (PO) review analyses were limited and often times generic for low-rated declined proposals. <u>COV Recommendations:</u> Although both merit review criteria were addressed, comments were longer for those that were awarded. Additional details are needed to enable improvements in declined proposals. Grant writers of declined proposals should, furthermore, be encouraged to re-submit future grant proposals based on documentation provided by NSF on areas for improvement. ATE staffing is down by at least five members due to recent retirements. Although the hiring process is in effect, this affects the quality of what can be done and how quickly it can be done in the program. Swift remediation of this problem is highly recommended. **Data Source: Jackets and COV Documents (Section 3)**	YES
3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals? Comments: Based on the COV's review of proposals, the majority of the reviewers' comments were substantive. However, a few included only brief summary judgments of the proposal quality with minimal explanation of strengths and weaknesses. <u>COV Recommendations:</u> Following the 2012 COV recommendation, the COV recommends that POs provide effective guidance to review panel chairs to ensure consistency of	YES

reviewer and panel summaries and more strongly require substantive comments from panel members. POs should continue to emphasize the importance of thorough and rigorous assessment to each reviewer and build in review milestones whenever possible to engage the reviewers. **Data Source: Jackets (Reviews)**	
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? Comments: In general, the panel summaries provided the rationale for the panel consensus. No cases were found where consensus was not reached. While some panel reviews contained individual evaluations that were disjointed, the summaries were generally concise and spoke to the strengths and weaknesses of the narrative. In reviewing proposals, panel members sometimes pointed out critical issues within a proposal; however, the proposal was later reviewed with a passing rating. <u>COV Recommendation:</u> The COV recommends that, in addition to providing reviewers with examples of how to review, NSF produce a weighted evaluation framework to help guide reviewers in terms of continuity and effort. No one framework will fit all situations, and this recommendation should be approached cautiously, so as not to impinge on the independent reviewer's strategy for evaluation. **Data Source: Jackets (Panel Summary)**	YES

5. Does the documentation in the jacket provide the rationale for the award/decline decision? [Note: Documentation in the jacket usually includes a context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.] Comments: In reviewing the proposals, context statements were as expected. For declined proposals, some PO Review Analyses were fairly basic. Some elaboration would have helped proposal writers improve for future proposal submissions. <u>COV Recommendation:</u> The COV recommends expanding the rationale for declination decisions to include whether the issues of the proposal were due to infrastructure, personnel, etc., as well as how to improve for future submissions. As PO review analyses tend to have more constructive comments, the COV encourages NSF to highlight these review analyses so PIs do not overlook them. **Data Source: Jackets**	YES
6. Does the documentation to the PI provide the rationale for the award/decline decision? [Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written in the PO Comments field or emailed with a copy in the jacket, or telephoned with a diary note in the jacket) of the basis for a declination.] Comments: A review of the selected proposals showed that PIs with awarded proposals were provided rationale for the decision made, which included additional post decision-making communications. In cases for declined proposals, PIs also received rationales for decisions. <u>COV Recommendation:</u> The COV recommends that a line of communication be strengthened and emphasized for PIs (and their institutions) with declined proposals as an opportunity to better enhance future submissions or to provide resources that allow PIs to gather more knowledge. **Data Source: Jackets**	YES

7. Additional comments on the quality and effectiveness of the program's use of merit review process: No additional comments.	

II. Questions concerning the selection of reviewers. Please answer the following questions about the selection of reviewers and provide comments or concerns in the space below the question.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE
1. Did the program make use of reviewers having appropriate expertise and/or qualifications? Comments: In reviewing the proposals, the COV team noted that some panels were comprised of all university reviewers, while other panels included university, community college, and industry representatives. Expert reviewer pools also should include secondary education teachers, institutional professors, employers/industry representatives, and those who focus on student transitional phases from high school to community college or community college to four-year institutions. COV Recommendations: The COV recommends using reviewers from a wider range of expertise such as academic deans in order to understand programmatic changes that need to be made on an institutional level as well as federal employees who may hire students serviced by ATE programs in the future. The COV reiterates a well-understood concept at NSF – diversity of perspective and experience will lend itself to a balanced and informed evaluation process. The COV recommends that in order to continue filling the pool of reviewers, NSF should provide novice reviewers a chance to participate in the review process. Novice reviewers may be granted a “no vote” status during their initial participation so they can familiarize themselves on the process in a no-risk manner. The COV recommends having a larger panel of reviewers to allow for a variety of expertise within a panel and additional sector representation. **Data Source: Jackets and COV Documents (Section 3.2 Reviewer Institution Information; 3.3 Reviewer Disciplines)**	YES

2. Did the program recognize and resolve conflicts of interest when appropriate? Comments: In reviewing the selected jackets, all conflicts of interest were noted when applicable and reviewers did not review proposals with any identified conflicts of interest. **Data Source: Jackets and COV Documents (Section 3.5 Proposals with Reviewer Conflict of Interest; Section 3.6 Procedures for Proposal Review Panels)**	YES
Additional comments on reviewer selection: <u>COV Recommendation:</u> The COV recommends that the selection of reviewers balance the needed areas of expertise and qualifications. In evaluating proposals that focus on early college and dual enrollment initiatives, the COV believes it would be helpful to recruit reviewers from secondary education who have significant expertise and insight.	

III. Questions concerning the management of the program under review. Please comment on the following:

MANAGEMENT OF THE PROGRAM UNDER REVIEW
1. Management of the program. Comments: The NSF ATE Principal Investigator Conference, held each year, is an excellent way to bring together all PIs to discuss critical opportunities and challenges within ATE. The ATE program is encouraged to explore the following: • additional opportunities for co-funding, • work/partnership with other NSF programs that serve K-12 students in order to bridge the gap between programs, • work/partnership with other funding agencies, and • open conversations with communities in order to focus on the emergent technologies that require innovative technician education. <u>COV Recommendation:</u> The COV recommends a stronger emphasis on the mission of ATE, which is to support the creation of new technical programs or the enhancement of older technical programs. This is of particular concern due to budget considerations and the increasing number of applications on STEM enhancements. It should be noted that, while the COV recognizes that ATE and STEM are not mutually exclusive initiatives, providing funding for innovative programmatic and pedagogical strategies related to applied fields must be the primary focus.
2. Responsiveness of the program to emerging research and education opportunities. Comments: There is a need for a stronger emphasis and responsiveness by the program to emerging research and education opportunities. An example of a major indicator of emerging research within the ATE program is the proposals awarded for nanotechnology. The ATE program could consider soliciting a study on how it handled that emergence over time – from when nanotechnology was first emerging to the present. Other educational opportunities worthy of study are the set of projects focusing on dual enrollment.

POs and directors are in a good position to identify emerging research and education opportunities for funding. POs are encouraged to continue their proactive role by identifying emerging technologies for the future through their industry networks, social media, and their own research interests.

COV Recommendation:

The COV recommends that institutions of higher education be encouraged to explore more grant opportunities related to dual enrollment and early college initiatives in technological education. Additionally, NSF must create awareness for, and potentially fund, ancillary educational strategies such as credit for prior learning (e.g., military credit equivalencies) and continuing education to curriculum credit crosswalks. As higher education performance metrics continue to emphasize persistence and completion and as industry begins to recognize alternative means for acquiring skill and proficiency, so should NSF by encouraging institutions to pursue these measures.

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

Comments:

COV Recommendations:

As part of program planning, the ATE program should look within its portfolio of awards to identify design principles and determine best practices and project/program impacts. These design principles would be used to inform future solicitations, provide guidance to review panels and proposal writers, and provide models for the ATE/STEM community.

The COV recommends establishing a Clearinghouse-type department where NSF information can be easily attained and understandable. Social media outlets like Twitter (where NSF has over half a million followers) could be leveraged to provide broader communications about ATE and other programs to the public.

4. Responsiveness of program to previous COV comments and recommendations.

Comments:

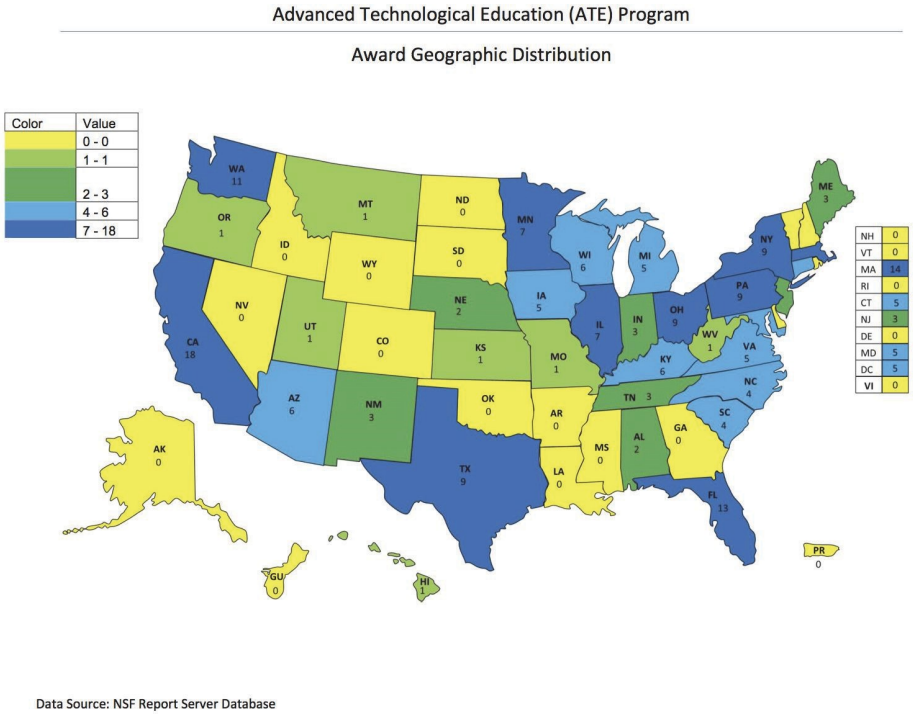
In general, the program was responsive to comments of the previous COV. There are a few recommendations that may need improvement, specifically providing effective guidance to review panel chairs to ensure consistency of reviews and panel summaries as well as requiring substantive comments from panel members to justify their assessments of proposal strengths and weaknesses.

In response to the previous COV recommendation on increasing outreach/support to disabled populations, the COV noted that NSF reached out and provided support for diverse populations such as the hearing impaired; however, the COV would like to know if NSF conducted outreach to other populations with challenges, such as the visually impaired.

IV. Questions about Portfolio. Please answer the following about the portfolio of awards made by the program under review.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE, OR DATA NOT AVAILABLE
1. Does the program portfolio have an appropriate balance of awards across disciplines and sub-disciplines of the activity? Comments: There was a robust and high percentage of awards for engineering and inter-disciplinary projects. As "interdisciplinary" encompasses an array of disciplines, the actual disciplines that fall under this category can vary. The COV noted that other disciplines, such as chemistry and physics, had few - if any - proposals, much less awards. There was a concern among the COV about the absence of proposals in the traditional lab sciences, which provide a foundation for the emergent technologies ATE desires to award. <u>COV Recommendations:</u> The COV recommends that ATE focus on disciplines with low proposal submissions in order to increase the balance of awards across disciplines and sub-disciplines. The COV also recommends that, within each discipline, there be greater specificity in focus (e.g., an engineering-based ATE grant on additive manufacturing) so as to inform institutions about trends in funding. For example, if NSF reports that, of eight awarded computer science ATE grants, six emphasized cybersecurity, institutions might consider: 1) responding to RFPs on a different aspect of cybersecurity or 2) determining alternative computing trends on which to base their efforts (e.g., considering industry support) **Data Source: Jackets and COV Documents (Section 4.3.3 Award Foci)**	APPROPRIATE

2. Are awards appropriate in size and duration for the scope of the projects? Comments: ATE's budget has not increased over the last five years, and the size and duration of projects also decreased. Because of the limited amount of funding, the awards were appropriate in size and duration. **Data Source: Jackets and COV Documents (Section 4.1 ATE Awards; Section 4.3.4 Average Award Size and Duration)**	APPROPRIATE
3. Does the program portfolio include awards for projects that are innovative or potentially transformative? Comments: The program portfolio included awards for projects that are innovative or potentially transformative. In reviewing the proposals, innovative proposals were awarded to regions where it might not have been innovative if proposed in a different region. Many proposals awarded used the word "transformative" to describe the work being conducted. **Data Source: Jackets**	APPROPRIATE
4. Does the program portfolio include inter- and multi-disciplinary projects? Comments: The program portfolio included inter- and multi-disciplinary projects. Of the 63 awards provided in FY 2014, 17 (or 27%) were for interdisciplinary grants, second only to engineering, which had 29 (or 46%). **Data Source: Jackets and COV Documents (Section 4.3.3 Foci)**	APPROPRIATE
5. Does the program portfolio have an appropriate geographical distribution of Principal Investigators? Comments: The top states with double-digit numbers of PIs were California (with 18 PIs), Massachusetts (with 14 PIs), and Florida (with 13 PIs). Although Massachusetts is relatively smaller geographically, it still had a comparable number with California and Florida.	APPROPRIATE

COV Recommendation: There should be additional outreach to yellow states (low awarded states) and coordination with EPSCoR as a method of increasing outreach.  **Data Source: Jackets and COV Documents (Section 4.3.1 Awards Geographic Distribution)**	
6. Does the program portfolio have an appropriate balance of awards to different types of institutions? Comments: The program solicitation states that the “ATE program focuses on two-year colleges and expects two-year colleges to have a leadership role in all projects.” Two-year colleges were the majority of awardees in each of the three years, and this has remained relatively steady through the past three fiscal years: • 2012: 52 awards to two-year colleges / 70 total awards (74%) • 2013: 36 awards to two-year colleges / 55 total awards (65%) • 2014: 43 awards to two-year colleges / 63 total awards (68%)	APPROPRIATE

Data Source: Jackets and COV Documents (Section 4.3.2 Award Institution Type)	
7. Does the program portfolio have an appropriate balance of awards to new investigators? NOTE: A new investigator is an investigator who has not been a PI on a previously funded NSF grant. Comments: There was an appropriate balance of awards to new PIs. For example, 46% of the awards made in FY2012 involved "PIs new to NSF"; 49% in FY2013; and 51% in FY2014. <u>COV Recommendation:</u> It would be useful to differentiate between experienced PIs who are new to ATE and PIs who are both new to ATE and who have never managed a large-scale federal grant. **Data Source: COV Documents (Section 4.4 Principal Investigator Demographics)**	APPROPRIATE
8. Does the program portfolio include projects that integrate research and education? Comments: The program portfolio included projects that integrated research and education. <u>COV Recommendation:</u> The COV recommends increasing the focus on applied research on the community college level. Teachers at this level will have the opportunity to integrate research into education (e.g., theory to practice/action). **Data Source: Jackets**	APPROPRIATE

9. Does the program portfolio have appropriate participation of underrepresented groups? Comments: In some instances, the program portfolio did not have appropriate participation of underrepresented groups. For example, one proposal from a state with a large presence of tribal colleges did not show any tribal college participation in the proposal. Institution types did not show an appropriate level of participation from underrepresented groups. PIs were mostly white; however, data was not definitive with Co-PIs as the majority were classified as "Other or not Reported." Funding for females has grown by two percent, a small increase, but one that should be acknowledged. Approximately 25% of the PIs did not provide their racial and ethnic information. Unfortunately, this makes it difficult to gauge the true diversity of the applicants. The COV wonders if there are additional ways to collect diversity information from PIs when they submit their proposals. <u>COV Recommendations:</u> The COV encourages NSF to continue its efforts to increase the participation of underrepresented groups in STEM initiatives for both PIs and project participants by identifying demographics beyond the data given to include age, disability, and industry sector. NSF should encourage involvement of all underrepresented groups. Additionally, NSF should recommend that institutions collect data about students' completion of grant-funded programs and job placement outcomes, disaggregated by demographics, to determine if the ATE program truly impacts and augments workplace diversity. **Data Source: Jackets and COV Documents (Section 4.3.2 Award Institution Type; Section 4.4 PI Demographics; Section 4.5 Co-PI Demographics)**	SOMETIMES APPROPRIATE
10. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports. Comments: In reviewing the proposals, the program was relevant to national priorities, agency mission, relevant fields, and other constituent needs.	APPROPRIATE

Citations include: Executive Office of the President, President's Council of Advisors on Science and Technology. (September 2010.) *Report to the President – Prepare and Inspire: K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future*. • "Information and computation technology can be a powerful driving force for innovation in education, by improving the quality of instructional materials available to teachers and students, aiding in the development of high-quality assessments that capture student learning, and accelerating the collection and use of data to provide rich feedback to students, teachers, and schools. Moreover, technology has been advancing rapidly to the point that it can soon play a transformative role in education." (p. xi) • "Furthermore, employment in STEM fields is increasing at a faster pace than in non-STEM fields. Even during the recent recession, companies in STEM-related fields, such as in the aerospace, defense, life sciences, and energy sectors, reported shortages of skilled workers, and these shortages are expected to persist. Moreover, many professions once perceived as not requiring STEM skills, such as agriculture and law, increasingly require technological and scientific proficiency." (p. 16) NSF Strategic Plan for Fiscal Years 2011-2016. • "Three interrelated strategic goals – transform the frontiers, innovate for society, and perform as a model organization." (p. 5) • "The Foundation embraces our unique role in supporting the fundamental, interdisciplinary, high-risk, and potentially transformative research and education that are central to the discovery of emergent properties and structures in physical, living, human, and engineered systems." (p. 6) • "The Foundation promotes inquiry-based instructional practices and ongoing research on the process of learning and the practice of education to improve the nation's capacity to draw in and retain students in STEM fields, including students from underrepresented groups and institutions." (p. 7) **Data Source: Jackets and COV Documents (Section 2.2 Legislation Establishing ATE; Section 2.3 ATE Program Development Timeline; Section 2.5 Management Plans)**	

11. Additional comments on the quality of the projects or the balance of the portfolio: <u>COV Recommendation:</u> The ATE program should continue its efforts to increase the number of technicians working in emerging technology fields. The COV encourages the ATE program to find ways to be responsive to business and industry as well as find ways to encourage participation of diverse populations (e.g., adult learners, immigrants, and other groups).	

OTHER TOPICS

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

The COV identified three major areas for improvement in its analysis: adhering more strongly to the mission of the ATE program, augmenting diversity among awarded PIs, and increasing PO staffing in order to enhance outreach efforts and increase communications.

Mission

- Engage with industry, researchers, and educational institutions to continue education/workforce development aligned with emerging technology trends.
- Focus on co-mingling efforts such as work-based learning, applied research, and integrated learning.

Diversity

There is a gap in underrepresented populations, as illustrated in the need to address the following:

- Increase participation from underrepresented groups through co-funding (e.g., EPSCoR).
- Incentivize institutions to write grants on methods and practices related to increasing minority participation in STEM and ATE initiatives; this includes encouraging males to enter traditionally female-dominated disciplines in the allied health occupations.
- Provide increased outreach to Tribal Colleges, HBCUs, and HSIs to emphasize the importance of grant-funding programs at these institutions.
- Determine why State Educational Agencies and Local Educational Agencies are not receiving any ATE awards through surveys and focus groups.

Staffing

- Create awareness about employment opportunities at NSF at the annual ATE conference.
- Identify potential candidates for PO positions who are external to the agency — reviewers, rotators, etc.

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.

NSF should examine why some PIs have multiple declinations and no awards. While this is largely an institutional issue and not an NSF issue, it is still important to gauge whether there are means to mitigate this and reinforce the requirements for producing a cogent, comprehensive, and fundable deliverable.

Increase collaboration with other international programs and departments – there has been some international collaboration. A good way to address this issue and increase collaboration is to work with American community colleges that have successful partnerships with Mexican technical colleges. Given an ever-increasing range of scientific and technical areas that transcend borders (e.g., global warming and other weather-related problems, hunger, disease, communications), international efforts will also be increasingly necessary.

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

Flat funding during the past five years has limited what the ATE program can fund. Although the program is unable to control how much funding will be received, it can influence the types of proposals it funds. Some reviewers worried about sustainability of some proposals; this might be an increased risk factor if those types of proposals get funded.

COV Recommendations:

The COV recommends increasing efforts on global issues. Water and global warming are issues other countries are tackling, and this is a good opportunity for ATE program to work on a global level.

The COV recommends developing a recruitment day/event for staff and faculty members in the community colleges; this would provide a chance for participants to review projects and give a centered point of view on the programmatic changes addressed in ATE projects. It is also important for institutions to be aware of the differences between a funded proposal and a non-funded proposal and the weaknesses seen in the latter that constrained the agency from awarding monies.

4. Please provide comments as appropriate on the program's performance in supporting career pathways including early college high school and dual credit opportunities.

- Emphasize advanced manufacturing/advanced industries initiatives at the secondary education levels.
- Increase awareness of interlinking STEM with ATE through contextualized instruction, applied research, and project-based learning.
- Encourage dual credit opportunities, funding not only for secondary education but also for other populations such as military veterans.

5. Please provide comments on the perceived effectiveness of the three types of centers (National, Regional, Support).

According to its website, NSF differentiates centers as follows:

- National centers lead nationwide, industry-specific reforms.
- Regional centers focus on a particular industry within a specific geographic area.
- Resource centers promote the leadership capacity of educators in one or more technological area.

Given how industry funds its initiatives (e.g., tax incentives from states) and where it determines how it can be best served (e.g., strength of educational and training systems), regional centers seem to have the most impact. An industry that is robust and thriving in the Midwest, for example, may be unfeasible in the South for various reasons. A regional center also has its finger on the pulse of the institutions that it serves and recognizes that state and accreditation guidelines for regional colleges drive decisions related to program and course implementation and sustainability.

Resource centers are broad-based educational initiatives that grow communities of practice among grant-funded institutions . With current trends in evaluation and big data, it is helpful and comforting to know that resource centers are available to provide open forums for information sharing.

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

The COV suggests that the first communication to a declined applicant should come directly from the PO in order for the rejected proposal/PI/college to receive a well-rounded notion as to how they might improve their chance in a future submission. This would answer a concern that writers of declined applications were only looking at the external reviewers' comments for advice on improvement. The PO comments provided more nuanced responses, and the COV encourages NSF to look for ways to increase Pis' focus on these comments.

The COV recommends explicitly making distinctions in the solicitation that would enable Pis writing proposals to realize when their proposal is better suited for a different NSF program (e.g., S-STEM, IUSE, ITEST). Tightening up the solicitation wording for proposal requirements may assist Pis in writing effective proposals. NSF may request that Pis connect technology trends with innovative pedagogical models (e.g., badges, stackable credentials) and address the transformative possibilities in the narratives.

The COV recommends the idea of stackable credentials where students can select courses based on the skill sets they need to succeed in the workforce as opposed to the skill sets they need for a discipline. By promoting the education opportunities for technicians, ATE will continue to add to the growing workforce.

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

- Provide data about funding of functional areas (e.g., 3D printing, nanotech) and the broader outcomes of the grant initiatives (e.g., economic impact, conversion of a Project grant to a Center, etc.).
- ATE should provide a report on impact, both quantitatively **("X"** jobs created or sustained and "$" impact to state) and qualitatively (success stories, testimonials, and best practices).

The Committee of Visitors is part of a *Federal advisory committee. The function of Federal advisory committees is advisory only. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the Advisory Committee, and do not necessarily reflect the views of the National Science Foundation.*

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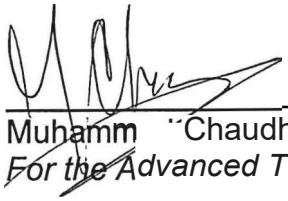

Muhamm ¨Chaudhry, Chair
For the Advanced Technological Education (ATE) Program Committee of Visitors