NSF RESPONSE TO COV REPORT
ADVANCED TECHNOLOGICAL EDUCATION

Division of Undergraduate Education
Division of Elementary, Secondary, and Informal Education

Committee of Visitors of April 10 – 11, 2006

Part A. Integrity and Efficiency of the Program' Processes and Management

A1. Quality and Effectiveness of the Program's Use of Merit Review Criteria

Recommendation: Incorporate technology processes for more effective access to the records and record keeping.

Program Response:
The ideas presented in the discussion under this recommendation are the purview of those who develop the NSF systems and are not under the control of NSF program officers. NSF policy states that proposals must be reviewed unless they are submitted past the deadline date, violate formatting rules, fail to address intellectual merit or broader impact, or are totally inappropriate for the program. Additional screening would require a change in NSF policy. The program will share this recommendation with the NSF policy office.

Recommendation: Define better the process of decision making following the review panel, role of program officer in final decision.

Program Response:
The ATE program has a very well defined process for making funding decisions after panel review. New program officers are instructed in the process and are part of decision making process. A memo is prepared each year and attached to each electronic jacket entitled the Proposal Recommendation Process. A hard copy is placed in all official jackets. This decision process is described in the management plan. Program Officers submit to the lead program officers information about proposals that they believe should have the highest priority for funding and information also on proposals that they would like to fund if funds are available. These proposals are discussed in meetings with program officers from panels that have similar foci. Suggestions are made to program officers and a final list is developed. Program officers consider the contribution of each proposal to the portfolio of ATE projects and centers. Program leads provide additional information as needed if the project has had prior funding.

Recommendation: Implement distance technology/video conferencing to complement the site visits program.

Program Response:
While the program appreciates the recommendation that distance and video conferencing complement the site visits program, the program leads feel that the site

visits accomplish a large number of purposes that do not lend themselves well to videoconferencing. Beyond talking to the project leadership, the program officers can interact with more of the faculty involved, the administrators, and also the students. It is possible to meet with industry supporters and to understand better their role in the project. A site visit also provides an opportunity to see the facilities and equipment that the project is using. The project can also invite faculty and teachers from nearby institutions who are partners. Site visits also often involve a visit to the business or industry site.

In fall of 2006, more use of technology is being made in ATE program by instructing reviewers in the review process through webinars before the review panels. Technology is also used to provide information about the ATE program to prospective proposers and their institutions. Program officers often participate in meetings via videoconferences.

Usually only one meeting each year of a National Visiting Committee (NVC) for large projects and centers is face to face. At other times during the year, NVCs are held using telephone, videoconference, or via the internet. Program officers participate in these meetings.

Technology is also used to bring together ATE centers and projects to discuss topics of mutual interest. For example, two videoconferences were held in 2006 for ATE PIs that involved ATE program officers and grants officials to discuss the advantages and disadvantages of becoming a non-profit as the centers become more self-sustaining.

Recommendation: In the records, indicate impact of feedback in early stages – both with pre-proposals and to the funded PIs in follow-up negotiations.

Program Response:
The ATE program has done two studies of the value of the preliminary proposal process. Both have demonstrated the effectiveness of this process in terms of both increased success rates of those that submit preliminary proposals and the proposers' satisfaction with the processes. When a proposal is submitted via FastLane, proposers can show a related preliminary proposal. Program officers frequently look at recommendations from the preliminary proposal to see the impact on the formal proposal. To document completely the impact of preliminary proposals on each formal proposal however would involve more resources and time of program officers than is available and would not significantly add to the analysis of proposals.

To provide an extensive review of every proposal, including those that are considered non-competitive, would require additional personnel. NSF instituted the panel summary as one way for reviewers to provide a summary of the most salient points. Reviewers are instructed that the panel summary should be a summary of the discussion of the proposal and not a summary of all points made in the individual reviews. In general, review analyses for proposals recommended for funding provide significant information about the questions raised by the reviewers and NSF staff. When the proposal receives ranking well below the threshold for funding, the review analysis usually contains standard information so that program officers spend their time on proposals that may lead to funding in this or future competitions. However, even with low ratings, program officers often write comments that they hope will help the proposers submit more competitive proposals. ATE program officers provide additional comments when the

reviews are not sufficient to provide proposers the reason for the declination or when additional comments might result in stronger future proposals.

Recommendation: The review process should include an assessment of strategic indicators provided as they compare to the goals of the grant.

Program Response
The COV requested a matrix of specific indicators for assessment of outcomes. The Lead Program Directors feel that producing a matrix may lead people to simply check the boxes and not provide sufficient information on the effectiveness and impact of the project. Evaluation has always been an important area of emphasis for the program. We have been working with both the program evaluator (Evaluation Center at Western Michigan University) and project evaluators to assure that the information provided to the projects and NSF supports the goals of the program and its projects. Many project evaluations are primarily about whether the activities were conducted and how many people or institutions were impacted (Were the activities accomplished? How many people participated?), but may have little information about effectiveness of those activities (What difference did the activities make?) While the program needs to make sure that activities are conducted and do impact people, the Lead Program Officers are encouraging the projects and their evaluators to include information about effectiveness. The ATE program solicitation is becoming more specific about the types of evaluation information that is needed.

ACTION: The program is working with the ATE Center evaluators and principal investigators to develop methods to aggregate project evaluation so that this can complement the Western Michigan evaluation of the ATE program. The 2007-2009 ATE program solicitation will contain a third track which focuses on targeted research on and studies of technician education programs.

Recommendation: Indicate more clearly the impact of comments on pre-proposals so that there is cumulative wisdom on how much these help.

Program Response:
The ATE program has done two studies of the impact of the preliminary proposal process on formal ATE proposals. Both have shown that proposals that are encouraged in the preliminary process are equally competitive with those that are resubmissions from the year before and much more competitive than formal proposals that are submitted without written feedback.

Recommendation: Give a model for reviews. Give key components and ask reviewers to address them every time.

Program Response:
The ATE program provides model reviews for reviewers for both preliminary and formal proposals. These are sent to reviewers at the same time they are given access to their proposals. Copies of these were provided in the COV book, but program officers may not have explicitly shown these to the COV members. For preliminary proposals, the examples demonstrate the review of a proposal that the reviewer wishes to encourage submission of a formal proposal and the review of a proposal that the reviewer wishes to discourage. ATE program officers explain that the reviewers should treat these reviews as an opportunity to mentor proposals. Thus these reviews contain advice on how to

make the proposal stronger. For formal proposals, the examples are how to write a review for a proposal that is to be rated very good or excellent, rated good, or rated fair (or poor). Reviewers however have not been provided a model panel summary.

ACTION: The program is introducing webinars this fall for reviewers that will prepare reviewers in a more systemic way to write reviews.

Recommendation: At minimum, the panel summary should be required to be a specific format that allows for the bulleting of all the major points.

Program Response:
To date the ATE program has not provided a model for a panel summary.

ACTION: The ATE program will provide to reviewers examples of model panel summaries in hopes of improving the summary information provided to proposers. Model panel summaries will demonstrate the recommended content for summaries supporting different panel discussions (e.g., those that the panel members rates highly and those that the panel members rate with lower scores). NSF's guidance is that the panel summary should summarize the panel discussion. It is not intended to repeat all points made in the individual reviews.

A2: MERIT REVIEW CRITERIA

Recommendation: Require PI to define a matrix of strategic assessment indicators to be used throughout grant processes and grant reports, This will provide an ongoing assessment component of success and effectiveness. This will provide a culture of evidence for the grant.

Program Response:

Project and program evaluation is a major emphasis for the ATE program. Responses to preliminary proposals and negotiations for awards emphasize the need for clearly specified evaluations which describe both impact and effectiveness. This is an ongoing education for PIs, evaluators, and program officers. Because NSF programs including ATE are designed to create models and break new ground and because projects and centers are funded for many activities, creating a matrix of assessment indicators would miss many components of impact and would tend to be quite mechanistic. Programs that have tried this find that proposers often just check every indicator.

ACTION: The ATE program is holding workshops with evaluators and PIs to address the issue. We plan to support a project to create a book specific to ATE that focuses on evaluation.

A3. SELECTION OF REVIEWERS

Recommendations: 1. NSF/ATE should approach corporate headquarters of industries for support of individuals in the corporation to review the grant proposals. 2. Due consideration needs to be given to reviewers from industries who are familiar with the global landscape. Technology should be considered for the implementation of both recommendations. 3. Special efforts need to be made to approach and develop reviewers from community colleges. 4. Program officers

need to ensure that reviewers are familiar with the state-of the-art in the technologies under consideration.

Program Response:
Typical review panels are composed of three reviewers from two-year colleges and one each from secondary schools, four year institutions, and industry or business. There are also reviewers from professional societies and trade associations. In actuality about 44% of the reviewers are employed at two year colleges, many of these have had recent industrial experience. 35% are from four year institutions, but some of these have experiences in two-year colleges or have worked closely with secondary schools. There is about one person from industry on each panel and about half the panels have someone from secondary schools. The latter number is augmented by persons from other institutions and four year people who concentrate on K-12 education. The disciplinary expertise is met by persons from four-year colleges; but the industrial experience could be strengthened.

ACTION: We will work with our projects that have industry contacts to get additional names of industry personnel to add to lists of potential reviewers.

A4: RESULTING PORTFOLIO OF AWARDS

Recommendation: High-risk and innovation should be better defined. This could be shown graphically as high-risk vs. Innovative, with 4 quadrants. The projects in the highest-risk vs. most innovative quad would be funded as such. This should be mapped on the grid for all projects to show the portfolio.

Program Response:
We agree. Most projects are innovative within the context of their funding. Some projects are funded to undertake implementation activities by adapting materials developed elsewhere for new audiences. Some of the regional centers use materials developed by others to increase the number of students in the program and increase employer satisfaction with the employees who have gone through the program. Others are innovative in the discipline or the methodology. A few projects are proactive - educating employees for occupations that are developing. These may be considered high risk, but the risk is tempered by the fact that the students learn competencies that can be used in related occupations. The Division of Grants and Agreements (DGA) at NSF considers many of the projects supported by ATE as "high risk" because ATE supports many institutions that have had little to no NSF funding and support many new principal investigators. Other DGA indicators of high risk are the use of subawards and consultants, both of which are used frequently by ATE awardees. We would welcome a clearer distinction between risk and innovation in the COV report template.

Recommendation: It is suggested that NSF clarify for itself the distinction between the different types of centers (national, regional, resource) or develop another typology.

Program Response:
National Centers usually emphasize a single discipline and are designed to provide leadership for professional development; curricular (not materials) development; student recruitment, retention and placement; and interaction with the industry sector. After these Centers have been funded for seven years, they can request funding to continue

the core effort as a Resource Center. The national centers could be "sunset;" but many have developed close relationships with their industry sector. These would have to be developed by another center. Regional centers were originally limited to information technology and manufacturing because the ATE program was provided additional resources to concentrate on those two fields, but the regional centers have now been expanded to other fields. The regional center is to work closely with regional industry to increase enrollment in programs and to increase employer satisfaction with students employed. In a few cases, some centers have been funded that address a national problem on a regional basis. They have been so successful that other institutions from around the country have looked to them for national leadership. Also, in the first 8 years of the program, regional centers did not exist. A few of the national centers funded at that time would today be funded as regional centers. This makes sense from a programmatic point of view, but can cause confusion for reviewers.

Recommendation: develop strategies which can align rural and some urban community colleges within larger proposals with their suburban counterparts.

Program Response:
The ATE program will do an analysis of the types of two-year colleges supported by the ATE program and provide this information to the next COV. The easiest type information to get from external sources is by size of institutions and not by rural, urban, and suburban. The program is familiar with work done by researchers at the University of North Texas and will see if his classification will work for what the COV needs. An initial analysis however shows that the ATE program is supporting a large number of community colleges in very large urban areas (e.g., San Francisco, New York, Boston, Phoenix, Los Angeles, Salt Lake City) as well as mid-size urban areas (e.g.; Cedar Rapids, IA; Bettendorf, IA; Norfolk VA; Florence, SC). While the program has supported projects in rural areas (e.g., a consortium of 5 small community colleges in Arkansas), small rural colleges may not have the resources needed to submit large grants. We are working on this in three different ways. The 2007-2009 program solicitation will have a section for small exploratory grants to encourage new proposers and new institutions. In 2006 for the ATE Principal Investigators' Conference, we are allowing larger projects to bring along an additional college that they are mentoring and hope to get involved in their activities. The ATE program is also supporting a project at AACC called MentorNet where colleges (mostly smaller rural colleges) are mentored by current ATE grantees.

Recommendation: The ATE program may want to have a brainstorming workshop with the above type and other schools. Also look to strongly technical community colleges to partner with those with less technical expertise to work on collaborative proposals, which may include educational technology-based solutions for expertise transfer.

Program Response:
The ATE program, like most other programs at NSF, has a dearth of PIs and co-PIs who are from underrepresented groups. It may be that the LSAMP program can provide insights into this issue. The program actively recruits reviewers from underrepresented groups in hopes that they will submit proposals to the project. Because many PIs do not report ethnicity, we have not kept statistics on the success rates of minority proposers. We will continue to work with other programs at NSF who can help us attract more minority reviewers and proposers. ATE Centers have workshops and seminars and involve many other institutions in their activities.

ACTION: This year the ATE program is experimenting with allowing each ATE project or center that attends the ATE PI meeting to invite a colleague to attend from another institution that might be interested in the ATE program.

A5: MANAGEMENT OF THE PROGRAM UNDER REVIEW

Recommendation: However, we discussed the value of conducting an "ATE at 20" exercise. That is, where does ATE want to be after 20 years? What are their visions for the future? Good work is being done already, but what more could be accomplished in the next 10 years? Are there strategic directions that we could pursue that will more effectively help us achieve the goals of the ATE program?

Program Response:
The ATE program officers think that this is an innovative idea and have discussed this issue since the COV meeting. The Program solicitation has added opportunities over the years and also deleted components. The Program has been evaluated mainly for impact and there is an ongoing effort to determine ways to obtain data on effectiveness. This is an opportune time for the ATE Program to decide on new directions. The Program can take advantage of the "wisdom" of those who have worked in the program for some time coupled with engaging new Program Officers in changing the direction of the Program. The ATE Program can also sponsor outside focus groups. Because the current ATE Program leadership will transition in the next few years, NSF must appoint permanent Program Officers in both DUE and ESIE who can provide the national leadership for a program that will continue to change and grow for the benefit of science and engineering technician education. The ATE program is uniquely poised to take advantage of new developments for the American Competitiveness Act and the results of deliberations on 21st Century Work Skills.

ACTION: We will make plans for a meeting on the future of the ATE Program. ATE program officers did hold a Strategic Planning Meeting in August of 2006 and discussed future directions for the program.

Program Comment:
The COV was pleased with the ATE Program, its evaluation, and its outcomes, and the program appreciates the endorsement of where we are going and the impact that the ATE program is having. Many of the comments and recommendations are to NSF and not to the ATE Program.

All but two of the COV questions are answered with "Yes", indicating that the COV felt that ATE program was effective. However, we believe that we do have a good balance of appropriate institutional types (A.4.8) and do not understand the data on which this comment is based. The ATE program was funded by Congress specifically to utilize the resources of the nation's associate degree programs. All of our data show that this is what the ATE program does. While all of the grants must involve community colleges in leadership roles, the grants involve secondary schools, four-year institutions, and business and industry. We feel that this is the appropriate institutional types for the program as it was envisioned by Congress and developed by NSF. We will work on involving larger numbers of rural colleges in the ATE program.

The "No" for Question (A.4.11) is correct, but this is true for every program at the NSF that is not targeted for particular groups. We will continue to work on this issue.

Part B NSF's Strategic Outcome Goals
No Recommendations

Part C Other
No Recommendations

Submitted by Program Officers

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