

**National Science Foundation
Directorate for Engineering
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January 26, 2005

Dr. Kristina M. Johnson (Chair)
Dean, School of Engineering
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Durham, NC 27708-0271

Dear Dr. Johnson:

Thank you for transmitting the EEC COV Report. I share your concerns about ensuring that the ENG centers and human resource programs reflect a high level vision. This is being addressed as part of Directorate and Division level strategic planning efforts that are underway. I appreciate your suggestions for enhancing the quality of reviews through additional training and changes in the review process. The review process is integral to everything that we do and we are constantly working to improve this process.

I have attached a response to the recommendations in the EEC COV report that was prepared by Gary Gabriele, the DD for the EEC Division. I concur with this document and adopt it as the official response of the Directorate for Engineering.

I wish to express my appreciation to the individuals who participated in the COV review. This process is critical to the management of the Directorate and will help to guide our future decision-making.

Sincerely,



John A. Brighton
Assistant Director for Engineering



NATIONAL SCIENCE FOUNDATION
Division of Engineering Education and Centers
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MEMORANDUM

Date: January 24, 2005
To: Dr. John Brighton, Assistant Director for Engineering
From: Gary A. Gabriele, DD/EEC
Subject: Response to the Report of the Committee of Visitors for the Division for Engineering Education and Centers

I have read the report for the Review of the Division of Engineering Education and Centers conducted by the Committee of Visitors (COV) on March 16-17, 2004 and I am grateful to the Committee for the fine job they did of assessing the programs of the Division. I am very pleased that the COV found most aspects of EEC programs to be of high quality.

I note the following observations and recommendations of the COV Report that call for improvements:

1. The COV notes that, while most merit review procedures were found to be effective, a wide variance in the overall quality and level of detail of the reviews was observed. The report supports the continued use of the review templates that are currently used in EEC programs and suggests that these templates should be further improved to increase their effectiveness.

EEC wholeheartedly endorses this recommendation and notes that review quality has improved significantly since program-specific review templates were instituted division-wide at the urging of the FY 2001 COV. We will implement the specific recommendations to appoint a chair for each review panel and to insert language in each template urging the panelists to submit their reviews before the panel meeting. We will also provide a reference to the NSF document that provides guidance for and examples of activities that address the broader impact criterion (<http://www.nsf.gov/pubs/2002/nsf022/bicexamples.pdf>).

2. The COV suggests that the diversity of the reviewer pool should be increased and, while recognizing that current policies make the collection of comprehensive demographic data difficult, indicates its frustration with the poor quality of the demographic information provided to evaluate the diversity of the pool. In addition, the COV urges EEC to set diversity goals for all programs that are aggressive, but realistic.

Although there is room for improvement, EEC review panels currently include a significant number of women, underrepresented minorities, and industrial reviewers. Regarding data availability, there is talk of expanding to all of ENG a successful pilot

in SBIR and CTS of a system that prompts reviewers until they self-identify their demographic information. EEC will participate enthusiastically in such a system.

3. The COV found that the EEC portfolio of awards is consistent with program guidelines and reviewer recommendations. While praising the ERC program for its innovative awards, integration of research and education, and identification and support of new investigators, the COV recommends that smaller, interdisciplinary teams be funded in preference to increasing the size of individual ERC awards.

Developing a viable mechanism for funding “small, interdisciplinary groups” in ENG has been under discussion for at least 10 years. The establishment of the Nanoscale Science and Engineering Initiative enabled the funding of a significant number of Nanoscale Interdisciplinary Research Teams (NIRT), but did not address the broader issue of how to foster efforts in other disciplines of a scale between individual investigator awards and ERCs. In the current budget environment, even keeping ERC funding flat will only allow very limited funding for such efforts. This may be a good time to begin a planning process for the time when budgets begin to increase again.

4. The COV observes that EEC programs have been highly successful in meeting the PEOPLE goal and that its programs have had a dramatic impact on diversity, curricula, and pre-college outreach. Further, EEC programs have provided the impetus for entirely new degree programs, produced breakthrough results that are redefining performance limits in critical technology areas, and are making significant contributions to economic development.

We agree.

5. The COV observes that the overwhelming majority of EEC awards are to research-intensive institutions and that more capacity needs to be built at other institutions.

There is a bit of a “chicken and egg” issue here, in that many smaller engineering institutions don’t have the infrastructure to generate competitive proposals in our mainline programs. We are encouraging partnering and have asked ERCs to reach out to non-research-intensive institutions. We have also asked REU sites to recruit from smaller schools and have provided a number of Department-Level Reform planning grants to small departments and an implementation award in FY 2003 to Sweet Briar College to set up a new engineering program.

6. The COV recommends that EEC undertake a comprehensive study to answer the following questions: What will ERCs look like in 5-10 years? What are the overarching goals of the EEC Education and Human Resource Development Programs?

Both of these issues are being addressed as part of the division’s strategic planning process. In the case of the ERCs, the plan calls for a review of the underlying assumptions that resulted in the current ERC program, a review of the ERC-like activities in other countries, and the development recommendations for future changes in the program. In the education and human resource programs, the completion of a recent report by the Workforce Task Group (part of ENG’s strategic planning process) has provided a foundation for a new vision of where we focus

future solicitations. These new recommendations are also being developed in the divisions' strategic plan.

7. The COV requests that increased attention be paid to planning and assessment of the education and human resource assessment programs, including cross-project evaluation.

We are well on our way to realizing this suggestion, having funded a formal evaluation study of the department-level reform program from its inception in 2002, initiated an evaluation of the RET program in 2003, and completed a study of the PFI program in 2004.

8. The COV made recommendations with regard to the COV process. They requested that their instructions be modified to better specify the expectations of the NSF with respect to the deliverables from the COV process, that they are provided with easy electronic access to jackets, and that a method be developed for the random selection of an adequate number of jackets to provide a valid sample across all programs.

The COV instructions are modified every year and seem to be improving. This recommendation should assist that process. The jacket selection process is more difficult. For the FY 2001 COV, we selected every 10th jacket by jacket number, which should give a random sample, and in FY 2004, the chair of the COV selected the jackets for examination to assure broad program coverage. Both methods were found to be inadequate by the respective committees. As the FY 2004 COV observes, EEC programs are so diverse that it may be impossible for the COV to examine enough jackets during their time at NSF to make them feel comfortable that they haven't missed something. The answer may be to give COV members easy remote access to all of the jackets before the COV. We attempted this in the FY 2004 COV with mixed success, since we were the first to try it and we encountered a number of bugs. A number of improvements have been made to the e-Jacket system since this past summer and should allow future COVs to take full advantage of the system.

In summary, I am glad to see that the Advisory Committee on Engineering has accepted the COV report. In their letter of acceptance, they note that excellent work of the Centers program but recommend that we review the strategic direction of both the ERC and the I/UCRC programs. The planning for this is currently underway and will be a key component of the division's strategic plan. They also suggest that a similar high-level strategic vision be developed for the engineering education and human resource programs. A recent report by the Workforce Task Group has done much of the foundational work needed to develop this vision which will also be included in the division's strategic plan.