



*Division of Electrical, Communications and Cyber Systems (ECCS)  
Directorate for Engineering  
National Science Foundation*

## **RESPONSE TO THE 2014 COMMITTEE OF VISITORS (COV) REPORT**

### **I. Introduction: The 2014 ECCS COV Meeting and Committee Report**

The Committee of Visitors (COV) met on September 15<sup>th</sup> and 16<sup>th</sup>, 2014 to review programs in the Division of Electrical, Communications and Cyber Systems (ECCS) in the Directorate for Engineering. The COV committee assessed the operations of the ECCS Division in fiscal years (FY) 2011, 2012, and 2013. Chancellor Linda Katehi served as COV Chair with Drs. Karen Butler-Purry and Lance Collins serving as COV Co-Chairs.

The 2014 ECCS COV review differed from those of previous years in that the level of analysis was strategically focused program management and operations, in specific:

- 1. The quality and integrity of the merit review process within ECCS*
- 2. The quality and integrity of ECCS program operations, and*
- 3. Program-level technical and managerial matters pertaining to ECCS proposal decisions*

During the review, the COV evaluated over 250 proposal actions that were randomly selected over the three-year time period. Data tables summarizing all proposal actions during the three year review period were also provided to COV members as well the prior 2011 ECCS COV report and the associated Division response. This information, in conjunction with the on-site meeting with ECCS program staff and management, formed the review and basis for the COV Report.

The 2014 COV Report addressed the quality and effectiveness of the program's use of the merit-review process, the selection of reviewers, the management of the program under review, and portfolio of awards. The COV Report concluded with comments and recommendations regarding agency-wide issues that might be addressed by NSF to help improve the program's performance. The finalized report was then submitted by the COV Committee Chair to the Chair of the ENG Advisory Committee, Dr. Patrick Farrell.

The ECCS Division wishes to thank the members of the 2014 ECCS COV Committee for their time and effort in thoughtfully reviewing the activities of the Division. ECCS is especially grateful to Drs. Linda Katehi, Karen Butler-Purry, and Lance Collins as COV Chair and Co-

Chairs for their exemplary leadership during the COV process, resulting in a timely completion of the final report.

The Division is pleased with the overall positive assessment of its performance and progress in meeting the Foundation's goals. ECCS appreciates the thorough review and the realistic, actionable recommendations laid out in the COV Committee Report.

The following sections represent the ECCS response to the specific recommendations and observations presented in the 2014 ECCS COV Report. Each response is presented in the same order as the recommendations/observations presented in the COV Report Executive Summary. If deemed necessary for clarification, passages from the full report are quoted.

## **II. COV Report Recommendations**

Observations and recommendations from the 2014 ECCS COV Report regarding new issues or derivative issues from actions taken in the past three years are presented below:

### **1. Submission Window for Unsolicited Proposals**

*“The 2014 COV expressed a concern about the impact of the single window per annum relative to the ability of junior faculty members to successfully compete for grants in a way that makes them successful in their faculty careers, especially as it pertains to the promotion and tenure requirements. The COV makes the following two recommendations in relation to the above concerns:*

- *ECCS should collect more data and should modify the submission process (timing of submission and submission window) as needed to achieve the desired outcomes*
- *ECCS should consider developing a program similar to the Research Initiation Grant Program to help young investigators in their early stages of their research career.”*

**Response:** The ECCS Division shares the COV Committee's desire to increase the quality of proposals submitted to the Division as well as support of early career faculty members.

Currently the ECCS Division is collecting additional data on FY14 and FY15 Unsolicited Proposal submissions and comparing these submissions to those from prior years to assess the impact of one submission window on the research community. The Division will also pay close attention to the impact, if any, of a single unsolicited proposal window on younger faculty proposers. If it is determined that the positive outcomes anticipated from the single submission window are not being met, the Division will re-evaluate and make adjustments as needed.

In regards to the COV Committee's suggestion for developing a program similar to the Research Initiation Grant Program to support investigators in their early stages of research career, the ECCS Division will evaluate the possibility of establishing such a program.

### **2. Understanding the impact of the extensive use of panels on the merit review process:**

*“As per ECCS self-study, the vast majority of the proposals are reviewed via traditional on-site panels.....ECCS is encouraged to consider running a pilot program to assess the effectiveness of virtual and hybrid panel reviews. Such a pilot will point to the efforts that need to be undertaken to make these panels effective and efficient. Using technology effectively to reduce the number of on-site visits may reduce the time of review and may encourage more experts to participate in review panels.”*

**Response:** The ECCS Division will assess the impact of virtual and hybrid (virtual and on-site) panels on the quality of the panel review as a whole.

The Division sees value in the face-to-face interactions between panelists and Program Directors during on-site panels. However, the panel planning process is time-consuming and difficult to maintain given recent budgetary restrictions on travel.

The Division sees the use of remote technologies for virtual or hybrid panels as an opportunity to better accommodate panelists with disabilities (or those who are unable to travel) as well as potentially increase participation from west coast and international experts. The cost of virtual panels is also less than on-site panels. However, the Division has a concern about losing some of the interactions made when panelists are physically in the same room together with their colleagues.

Therefore, ECCS will take a closer look at the effectiveness of virtual and hybrid panels within the constraints of budget, participation, and program goals.

### **3. Success of the Supplemental Funds Programs (REUs/RETs)**

*“ECCS and NSF have spent substantial resources as part of the Supplemental Funds Program (REUs/RETs) but have done so without assessing the success of this program in achieving its expected goals: to provide more opportunities to undergraduate students for participation in research and thereby making U.S. students more interested in pursuing higher degrees. The COV suggests that ECCS devise a way to assess the effectiveness of this program.”*

**Response:** ECCS is committed to supporting the professional and academic development of U.S. students and teachers and will continue to support the REU/RET program in response to the research and educational community’s needs and desire for such programs.

In an effort to address the COV recommendation and the Division’s own mission to support STEM education and workforce, ECCS will seek a means to assess the tangible outcomes of the REU/RET programs. To that end, the Divisions is currently compiling data on REU and RET participants and looking to match (if possible) participants with outcomes such as curriculum developed as a result of an RET award or students pursuing advanced studies in STEM fields as a result of REU (or possibly as a result of an RET if participating high school students go onto college in STEM majors or if the participating teachers pursue advanced degrees in a STEM field). This endeavor will require both quantitative and qualitative analysis. The outcomes and findings will be used to develop a means to assess REU and RET impact and inform future practices and policies.

#### 4. Understanding the Broader Impact Merit Review Criterion

*“The 2014 COV believes that “Broader Impact” has remained undefined despite many efforts. ... We would like to encourage ECCS to consider how “Broader Impact” can be achieved within the Program Officer’s portfolio and within the individual proposals to produce better outcomes and focus the research community in breakthrough science and engineering that has the potential to change the world in the near and long-term.”*

**Response:** The ECCS Division agrees with the Committee that “Broader Impact” is an important topic that needs to be further addressed. NSF continues to define how “Broader Impact” is to be incorporated into submitted proposals, reviewed by panelists, and enforced by program management. Currently, NSF has adopted three principles in relation to Merit Review (cited directly from revised NSF GPG III.A):

1. All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
2. NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These broader impacts may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
3. Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

Additionally, a set of five Merit Review Elements were incorporated into the review process of both Intellectual Merit and Broader Impact for proposals submitted due or after January 14th, 2013.

In an effort to clarify what is expected from both ECCS proposers and ECCS panel reviewers, the Division will work with NSF and ENG Leadership to assess the incorporation, implementation and enforcement of the revised “Broader Impacts” policies in proposals and awards. The Division will also continue to keep the research community and reviewers informed and educated as to current NSF Merit Review Policies and assist as best as possible in clarifying the term “Broader Impacts”.

One way to help clarify what “Broader Impacts” entails at both the proposal and panel review level would be to coordinate a workshop for the Electrical and Computer Engineering (ECE) community in which ENG and ECCS Leadership would meet with ECCS constituencies. The goal of this workshop would be to openly discuss “Broader Impacts” as it relates to the ECE profession, research, and education and solicit input from the community on how “Broader

Impacts” can align with their current priorities or needs. We anticipate holding such a workshop in FY2016.

In relation to program portfolio and outcomes of awarded research, the Division monitors outcomes in all awarded Annual and Final Reports as they relate to “Broader Impact”, and will continue to do so, to ensure balancing both societal and technical impact.

### **5. Reduced funding and duration of the unsolicited grants**

*“From the ECCS self-study data provided to the COV it seems that the funding and duration of the unsolicited grants in 2013 has been reduced. The COV would like to strongly encourage the Division to protect the integrity of the unsolicited proposals both in funding and duration.”*

**Response:** ECCS would like to thank the COV committee for their desire to protect the integrity of the unsolicited proposals in both duration and funding amount. The Division also shares this desire. The award funding and duration data tables presented to the COV committee in September were a conglomerate of ECCS awards and durations, in particular:

- Unsolicited for EPCN, EPMD, and CCSS Core (primarily 3 years in duration, \$350-\$360K on average)

For the unsolicited awards, there appears to be a reduction in duration, and thus annual award size. However, **this is not the case**. As stated in the NSF Award and Administration Guide ([AAG NSF 15-1](#)), “[t]he end date [of an award] may be changed as a result of approval of a request for continued support of a continuing grant, for a no-cost grant extension, or by approval of a request for supplemental support. When appropriate, the NSF Grants and Agreements Officer will issue an amendment to the grant.” This amendment typically occurs in the final year of the initial grant period and is subject to NSF approval.

Prior to the COV convening in September of 2014, a percentage of ECCS awards from 2011 with initial durations of three years were granted extensions, making the reported duration of these grants now four years. This drove the reported average duration numbers for awards in 2011 to slightly over three years.

The true award size and duration for ECCS unsolicited awards in FY11-FY13 (normalized in FY11 to account for the original grant duration without the end date extension) were found to be consistent among the three years with no sign of decrease in either funding level or duration.

### **6. Additional Comments from the COV Committee**

*“[I]t was noticed by the COV that the acceptance rate of EAGER proposals was essentially 100 percent. This led to considerable discussion by the COV around the process for the EAGER program. The discussion revealed the fact that indeed most EAGER proposals were not funded, but the precise means by which ideas were evaluated remained unclear.”*

**Response:** All ECCS Core proposals, such as Unsolicited, CAREER, and EAGER proposals, are reviewed in compliance with NSF established policies and procedures. EAGER awards represent “exploratory work in its early stages on untested, but potentially transformative, research ideas or

approaches” ([NSF GPG II.D.2](#)). Researchers submitting EAGER proposals are required, according to the NSF GPG, to “contact the NSF program officer(s) whose expertise is most germane to the proposal topic prior to submission of an EAGER proposal. This will aid in determining the appropriateness of the work for consideration under the EAGER mechanism; this suitability must be assessed early in the process.” The ECCS EAGER success rate noted by the COV conveys the fact that the majority of EAGER proposals submitted to the Division have already been discussed with at least one ECCS Program Director prior to submission and determined to be appropriate for the program. The statement made by the COV committee regarding the majority of EAGER proposals that do not get funded is in reference to those potential proposals that have been determined (through discussions between ECCS Program Director(s) and the researcher prior to submittal) to be a better fit for other NSF solicitations or funding opportunities. These proposals are therefore not submitted as EAGERS and are not counted in the EAGER funding rate.

*“Another question discussed by the COV is: how do program managers address the potential conflict of interest of a reviewer whose intellectual expertise or organizational representation (for industry representatives) may be in direct competition with the proposed ideas?”*

**Response:** ECCS informs and advises panelists and reviewers of NSF’s definitions and policies regarding conflicts of interest (COI). ECCS Program Directors prescreen potential reviewers and avoid identifiable conflicts prior to the panelists selection. Any unforeseen conflicts that are discovered or disclosed afterwards are formally dealt with according to NSF rules and regulations. The ECCS Ethics Representative is kept informed of all issues that need to be addressed.

### **III. Conclusion**

The ECCS Division is truly appreciative of the constructive feedback from the COV members and will use the recommendations set forth by the Committee to further improve program operations and management. Again, the Division thanks the 2014 ECCS COV Committee for their time and effort and especially acknowledges the leadership of the COV Chair and Co-Chairs, Drs. Linda Katehi, Karen Butler-Purry, and Lance Collins.