

## CORE QUESTIONS and REPORT TEMPLATE

### FY 2014 Committee of Visitor (COV) NSF Office of International and Integrative Activities (OIIA), International Science and Engineering Section (ISE)

<b>Date of COV:</b> September 16-17, 2014
<b>Program/Cluster/Section:</b>
<b>Division:</b> International Science and Engineering Section
<b>Directorate:</b> Office of International and Integrative Activities
<b>Number of actions reviewed by COV:</b>  <b>Awards: 41</b>  <b>Declinations: 56</b>  <b>Other: 13</b>
<b>Total number of actions within ISE during period under review:</b>  <b>Awards: 944</b>  <b>Declinations: 1547</b>  <b>Other: 682 (including 177 PIRE pre-proposals, 391 co-fund actions (primarily GVF), 40 Returned without Review, and 74 Withdrawn)</b>
<b>Manner in which reviewed actions were selected:</b> The sample of proposal actions was selected by ISE staff in consultation with the COV chair using a stratified random process based on program, proposal action, and other relevant variables.

**INTEGRITY AND EFFICIENCY OF ISE'S PROCESSES AND MANAGEMENT**

Briefly discuss and provide comments for each relevant aspect of ISE's review process, management, portfolio balance, and representational activities. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were completed within the FY 2011 through FY 2013 timeframe, and other information provided to you . Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

<p><b>I. <u>Quality</u> and Effectiveness of ISE's Use of Merit Review Process.</b> Please answer the following questions about the effectiveness of the merit review process and provide comments or concerns as appropriate.</p>	<p>Yes, No, Data Not Available, Not Applicable</p>
<p>1. Are the <u>review methods</u> (for example, panel, ad hoc, site visits) appropriate?</p> <p>Comments The review methods that ISE uses are appropriate given the balance of number of proposals, the different kinds of proposals submitted (single year graduate student travel proposals to multi-investigator multi-institutional multi-year international collaborative proposals), size of staff, and broad range of budgets.</p> <p>External and panel reviews were thoroughly handled and evaluated. Over time it was noticed that many of the small budget proposals with ad-hoc reviews were unevenly reviewed, resulting in a decreased level of feedback. Many of those proposals came from early career researchers where feedback would be even more valuable.</p> <p>For 2012 and 2013 EAPSI did not use external review. The documentation for individual decisions is difficult to evaluate, as there is limited information in the jackets. The committee supports ISE's decision going forward to utilize external panels to review the EAPSI proposals. The committee appreciates the workload and cost to NSF and the community of reviewers, but also acknowledges the tremendous benefit for early career scientist and engineers to have more in-depth feedback.</p> <p><b>Data Source: Jackets</b></p>	<p>YES</p>
<p>2. Are both <u>merit review criteria</u> addressed</p> <p>a) In individual reviews?</p> <p>b) In panel summaries?</p>	<p>YES</p> <p>YES</p>

<p>c) In Program Officer review analyses?</p> <p>Comments</p> <p>The internal, ad-hoc, and panel summaries most often, but not in every case, addressed both merit review criteria. Some of the panel summaries were short and could be more informative to the PI.</p> <p>The COV noted that some individual reviews (around 3-5%) did not address both criteria. The COV appreciated the format of many of the reviews that identified and included strengths and weaknesses in both criteria.</p> <p>The COV observed that broader impacts were unevenly addressed in both the reviews and the review analysis. Better guidance to both PIs and panelists on broader impacts is needed, namely what constitutes broader impact and how to assess it.</p> <p><b><i>Recommendation 1: Continue to emphasize strengths and weaknesses under each merit criterion in the panel summary.</i></b></p> <p><b><i>Recommendation 2: Provide greater guidance to PIs and panelists on what constitutes broader impact and how it will be assessed.</i></b></p>	<p>YES</p> <p>YES</p>
<p>3. Do the individual reviewers provide <u>substantive comments to explain their assessment</u> of the proposals?</p> <p><i>Comments:</i> See the response to item #1 above. Given the constraints that the ISE program has faced recently, the reviews provided were appropriate, but the more feedback that can be provided, the better the process will be, especially for early career PIs.</p> <p><b><i>Data Source: Jackets</i></b></p>	<p>YES</p>
<p>4. Do the <u>panel summaries provide the rationale for the panel consensus</u> (or reasons consensus was not reached)?</p> <p>For the proposals that had a panel review, the summaries were of mixed quality. For proposals with larger budgets, e.g. PIRE, the panel summaries were generally thorough and detailed.</p> <p>For proposals with smaller budgets e.g. EAPSI, there were many cases</p>	<p>YES</p>

<p>where the summaries were missing, too short, or simple standard statements copied from one proposal to the next. The COV recognizes that the large number of proposals and small budgets contribute to the summary length and quality. but efforts must be made to increase the review depth to ensure transparency and fairness to all PIs and their proposals.</p> <p><b>Data Source: Jackets</b></p>	YES
<p>5. Does the documentation in the <u>jacket</u> provide the rationale for the award/decline decision?</p> <p>See previous comments. It was very common for the smaller budget proposals that simple boilerplate rationale was used in the jackets.</p> <p><b>Data Source: Jackets</b></p>	YES
<p>6. Does the documentation <u>to PI</u> provide the rationale for the award/decline decision?</p> <p>See previous comments. Documentation to the 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. In the case of PIREs, the report to the PI detailed the strengths and weaknesses for each section of evaluation. In the case of the smaller, individual PI awards (e.g., EAPSI), there was less attention to this detail, as described above.</p> <p><b>Data Source: Jackets</b></p>	YES
<p>7. Additional comments on the quality and effectiveness of the <u>program's</u> use of merit review <u>process</u>:</p> <p>Overall, the COV felt the jackets met the standard of quality and effectiveness in the merit review process.</p>	

<p><b>II. Selection of Reviewers.</b> Please answer the following questions about the selection of reviewers and provide comments or concerns as appropriate.</p>	Yes, No, Data Not Available, Not Applicable
<p>1. Did ISE make use of reviewers having <u>appropriate</u> expertise and/or qualifications?</p>	YES

2. Did ISE recognize and resolve conflicts of interest when appropriate?	YES
<p>Additional comments on reviewer selection:</p> <p>In nearly all cases where an external reviewer was selected, the COV felt that in all cases, the reviewers were competent in the field of the proposal and therefore highly qualified to conduct the reviews that they were assigned.</p>	

**III. Management of ISE.** Please comment on the following:

1. Management of the individual programs.

The COV found that ISE programs follow appropriate practices for soliciting proposals. These include Dear Colleague Letters (DCLs) and standard solicitations. The COV encourages ISE to continue use of diverse solicitation methods to reach the diverse pool of potential PIs.

ISE consults extensively with other directorates before issuing solicitations. Directorate representatives consistently praised ISE's collaborative and service/expert ethos, and it is apparent that consultation with other directorates is a strength of the ISE program staff.

The dwell time of proposals from 2011-2013 at ISE was approximately six months, despite a decrease in program managers and concomitant workload increase.

The COV is aware that NSF has contracted an independent and external evaluation firm for the reviews of the 2014 PIRE proposals. That evaluation is now underway. For several reasons, this evaluation is expected to be a critical tool for NSF in developing strategies for PIRE and ISE, as PIRE occupies nearly one-half of the ISE budget, and is one of NSF's flagship programs for funding large-scale international collaborations. It is the only large-scale program based in ISE.

The external evaluations of IRFP and EAPSI (when conducted) were excellent and demonstrated that both programs are exceeding their goals.

2. Responsiveness of ISE to emerging research and education opportunities.

Comments:

The ISE staff is proactive in reaching out and listening to the S&E community, the Foundation S&E Directorates, and S&E arms of Federal agencies to identify emerging international research and education opportunities. Recent examples of these programs include CNIC, GROW, PEER and SAVI, all of which have been strongly supported by the S&E community. ISE's unique mission to support the best S&E that includes a substantive international dimension while engaging early career PIs is essential to the NSF and the Nation.

In addition to post-secondary education, some of ISE's funded projects have impacted K-12 initiatives.

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

The Committee acknowledges and recognizes the unique and critical role that ISE serves within the NSF. ISE programs and non-programmatic support are essential to NSF and serve an important role in supporting the Nation's global competitiveness and engagement.

In this context the COV has several observations:

- The recent instability in ISE leadership has resulted in ad hoc planning and prioritization.
- Clear roadmaps to accomplish goals are missing.
- ISE program managers have worked effectively with disciplinary directorates for guidance on science and engineering portfolio decisions.
- Global regional focus areas are largely European and Asian. The evolving PEER partnership with USAID in developing countries has expanded the global reach and is viewed as very positive. It has clearly served as a catalyst for other agencies and is a testament to ISE's leadership.
- Some decisions regarding ISE programs have been top down (e.g. guidance to PIRE program officers not to request matching funds from disciplinary programs, IFPR co-funding that limited the areas in which postdocs could be supported, and IRES review with REUs).
- The ISE advisory committee (AC) has not met in the last year.
- The Draft Strategic Framework is a very good starting point for addressing some of the shortcomings in planning.

Recommendation 3:

Stability in leadership of the ISE is an essential next step and a director of ISE should be selected soon who can provide sustained leadership for a reasonable period moving forward.

Recommendation 4:

An ISE retreat should be held as soon as possible and in particular before the next round of 2015 proposals start coming into the ISE. A retreat would be very helpful and informative for the ISE program to identify and discuss immediate next steps.

**Recommendation 5:**

The ISE-AC needs to meet as soon as possible to address the Strategic Framework and this report, perhaps before the ISE retreat so that the AC recommendations could be discussed.

**4. Responsiveness of (O)ISE to previous COV comments and recommendations.**

Letters were provided to the previous COV on actions to address the recommendations.

**IV. Portfolio Review.** Please provide comments on ISE's programmatic portfolio goals, catalytic initiatives, and representational activities.

1. Please provide comments on whether ISE's portfolio goals are appropriate and whether ISE has achieved a proper portfolio balance. Please include comments on any program areas in need of improvement or gaps within program areas.

**Portfolio goals:**

ISE's strategic framework outlines three focus areas, which were similar to the portfolio goals considered by the 2011 COV. Those goals are: Workforce; Partnerships; and Leadership.<sup>1</sup>

- a. "Cultivating a globally-engaged U.S. science and engineering (S&E) **workforce** that includes international research experiences as a core component of training the U.S. S&E workforce of the future, and facilitates international collaborations for researchers at all career stages"
- b. "Assuring access for U.S. investigators to expertise and resources worldwide by leveraging U.S. investments through world-class **partnerships** with counterpart agencies abroad, for proposal-driven research programs as well as for shared research facilities, and by anticipating partnerships in countries with emerging S&E infrastructure"
- c. "Building innovative capacity through U.S. global **leadership** in scientific excellence, ethics, and management of research"

<sup>1</sup> "Advancing Transformative Science and Engineering through International Engagement: A Strategic Framework," Office of the Director, National Science Foundation, January 2014, p. 4.

Based on discussions with ISE staff, it appears that a major focus of the ISE portfolio is on development of the S&E workforce in the U.S. by facilitating valued collaborations among researchers—including students—across nations. Partnerships were deemed important to achieving workforce development and training goals. Conceptually U.S. leadership was not necessarily described as the drive to be “number one” on key S&E statistics (e.g., research intensity aka R&D/GDP), but more so for the U.S. to be a critical source of transformative ideas, frameworks, methodologies, data infrastructure, and scientific acumen, which can be leveraged out to the global scientific community. It was also clear from discussions within the COV and with the ISE that the emergence of other countries in S&E leadership roles could be a positive development for U.S. scientific, technological and innovative advancements.

**Portfolio balance:**

ISE’s portfolio of activities is diverse, spanning large grants to seasoned scholars (e.g., PIRE) to very small grants to graduate students for dissertation research. Roughly half of ISE’s budget is devoted to funding PIRE grants. This is seen as a strength of the ISE’s program so long as the concerns raised by the COV about the unevenness of the reviews of the smaller proposals can be addressed.

While smaller awards consume measurable resources of the ISE section another key focus of ISE program officers is service to other non-ISE NSF staff as they develop their own programs with international components and visit partners in regions around the world—especially Europe and East Asia. This expert or liaison component is also highly valued by external stakeholders, including staff at the U.S. Department of State, AID, and other agencies in the US and abroad.

However, balancing programmatic and service activities appears to be a challenge for ISE, particularly since ISE staff has been reduced by 40% since 2011 and there is no permanent section head who defines the strategic purpose of the unit.

In summary, ISE has an impressive portfolio of activities, which add value to the Foundation and are appreciated by stakeholders in the U.S. and abroad. However, portfolio management requires strong leadership direction, particularly someone who can effectively articulate the resource proposition for the unit to top decision-makers at NSF.

**Recommendation 6:** ISE staff reductions combined with record increases in the number of ISE proposals have led to a disproportionate increase in the workload of the remaining ISE staff. Additional ISE staff are critically needed to rebalance the workload within the ISE section.

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2. How catalytic has ISE been in helping to shape NSF’s international engagement?

The ISE has shown strong leadership in the development and management of many of the key international programs of the NSF. Through these programs, the ISE has

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developed a portfolio of international activities that provide students and researchers with international programs to advance their education and research activities, and serve the worldwide community as a resource for methods and knowledge in developing, managing, and evaluating international research and educational programs.

A key indicator of the strong leadership role that the ISE plays in international research and educational programs at the NSF was clearly demonstrated by the unanimous and strong support that all of the various program directors communicated to the Committee of Visitors (COV) in their discussions with them. All of the program directors indicated that the ISE was the “go to” section whenever they had any questions concerning and/or had any questions about any international aspect of their research programs. This support was believed by the program directors interviewed to be even more valuable than the financial support that the ISE often also provided to the various discipline-specific research programs.

In discussions with all of the stakeholders with which the COV spoke during their committee work, the COV came to the unanimous conclusion that the ISE is the key central leadership section in international education and research programs at the NSF, and indeed, even the US and the world.

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3. A large part of ISE’s workload involves “non-proposal” activities such as preparing briefing materials for senior NSF officials who are undertaking foreign visits or hosting foreign visitors, meeting with foreign visitors and planning detailed schedules for them as they seek to learn about NSF, participating in interagency working groups, and preparing documents on behalf of NSF for intergovernmental activities, etc. Given the above, is ISE optimally organized to carry out its responsibilities?

From the discussions with NSF program directors and ISE staff it is clear that non-proposal activities are valuable and are carried out thoroughly by ISE staff. The current organization is well structured to fulfill these types of activities, although there are some concerns related to a) fitting these activities into total workload given the current staffing level, and b) maintaining expertise levels when experienced staff leave ISE. There is no current mechanism for regular documentation of effort related to non-proposal activities. Such documentation would help in demonstrating the value added by ISE to NSF goals, and in assessing workload and staffing.

**Recommendation 7:** Develop and implement a simple way for ISE staff to consistently quantify and document non-proposal activities that contribute to the international goals of NSF.

## **V. Other Topics**

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

The third pillar of ISE's strategic framework addresses global leadership:

“Building innovative capacity through U.S. global **leadership** in scientific excellence, ethics, and management of research”

The COV is focusing on this third pillar because of the following context:

- the COV feels the pillar as communicated is awkward and does not reflect the potential role of ISE in shaping international S&E research investment strategies
- ISE is two years into a new organizational structure, and an upcoming review of its effectiveness is expected. The ISE should continue to have an SES-level leader.
- the establishment of initiatives like the GRC have positioned NSF and ISE as leaders in framing a number of critical issues worldwide (merit review, open access and integrity, partnerships with national research councils).
- NSF's unique ability to enable, and communicate the importance of S&E research, education and innovation as critical elements aligning with US priorities on the international stage for building prosperity, equality, peace and stability

With that backdrop, the COV has concluded

- the current position of NSF's international unit (as the ISE Section, downgraded since the last COV) in the NSF organizational structure does not reflect either NSF or ISE's priorities and strategies and diminishes ISE's ability to implement and serve NSF's international vision and strategy.
- stable leadership is essential. The most common discussion theme among the COV was the need for stable leadership.
- in addition to line leadership of ISE there is an opportunity for that leader to collaborate with NSF's OD on advancing the Nation's goals of building prosperity, equality, peace and stability through strong S&E research and education.

#### **Recommendation 8:**

- the organizational position of ISE should be revisited.

#### **Recommendation 9:**

- recruit and retain stable executive leadership, which should be an SES-rated position

#### **Recommendation 10:**

- define the role for the new leader to include the collaboration with NSF's OD on science diplomacy.

Two final comments

First, it is important to have good data on diversity of PIs served by the program.

Although the statistics automatically generated by internal systems cannot accurately determine gender or race/ethnicity from self-reports from PIs, it is possible to take at least a sample of proposals and awards, and have a program assistant determine the demographic landscape of the ISE portfolio.

Second, the location of ISE appears to be isolated from the programs with which they co-fund. ISE program officers spend a good deal of time in Stafford I and have long-standing relationships with program officers in the Directorates. However, the ease with which communications flow and new synergistic ideas are developed often relies on human interaction. Therefore, repositioning ISE to be physically closer to the other programs—as was once the case—could improve productivity and potentially transformational activities at the Foundation. Because a move of NSF HQ is anticipated in 2017, it would be good to find ways in the interim to better connect with the Directorates and Program Officers.

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

Please send the next COV an updated template with the correct dates and information on number of proposals.