FY 2014 REPORT TEMPLATE FOR NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: December 15-16, 2014
Program/Cluster/Section: Graduate STEM Fellows in K-12 Education (GK-12)
Division: Division of Graduate Education (DGE)
Directorate: Directorate for Education and Human Resources (EHR)
Number of actions reviewed: **Awards:** 2011(6) **Declinations:** 2011(8) **Other:**
Total number of actions within Program/Cluster/Division during period under review: **Awards:** 6 **Declinations:** 135 **Other:**
Manner in which reviewed actions were selected: All six awards made in FY 2011 are included. One decline from each of the eight review panels was sampled by choosing a proposal ending in the number “2.” When more than one such proposal was found, the proposal with the lowest overall number was selected. When there were no such proposals found in a panel, the proposal ending in the number “6” was selected. If there were more than one of these then the proposal with the lowest overall number was selected.

COV Membership

	Name	Affiliation
COV Chair or Co-Chairs:	Dr. Karen Klomparens	Michigan State University
COV Members:	Dr. Lori M. Bruce	Mississippi State University
	Dr. Robin L. Garrell	University of California, Los Angeles
	Dr. Alfonso Ortega	Villanova University
	Dr. Anu Ramaswami	University of Minnesota
	Dr. Henry Neal Williams	Florida A&M 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 were appropriate.
 	
***Note from Staff*: The review method for all GK-12 proposals is Panel Review. Background materials were selected as examples of the preparation process for developing panels, assigning panelists to panels and to proposals, orienting panelists and the panel process to ensure a high quality review of all proposals.**
 	
Background materials
• 1.1.0 One-page Program Description
• 1.1.1 Description of the GK-12 2011 Competition
• Panel orientation
  ○ 1.1.2 Pre-panel emails to GK-12 panelists, and agenda
  ○ 1.1.3 GK-12 Pre-panel webinar
• 1.1.4 GK-12 Management Plan 2011
	Yes

2. Are both merit review criteria addressed a) In individual reviews? b) In panel summaries? c) In Program Officer review analyses? Comments:	Yes

There is a range of responses – some that clearly address both criteria and some that lack a clear response for one or both criteria. There were a few instances where a proposal was awarded but the reviewer did not speak to the value or significance of the intellectual and/or scientific merit. The panel summaries in particular did not discuss the merit criteria fully. COV Recommendation: Echoing the previous COV's recommendation, this COV recommends implementing more mandatory webinar training for reviewers (including examples of good/helpful and bad/unhelpful reviews) – with particular attention to the merit review criteria – in an ongoing effort to generate better reviews. This is especially important for those who are not regular NSF reviewers. **Background materials** • 1.2.1 FY 2010 Guidelines and Criteria • 1.2.2 Points to Keep in Mind for Panelists • 1.2.3 Points for Panel Facilitators **Data Source: Jackets**	
3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals? Comments: The data provided for the individual reviews presents a mixed picture – some comments were substantive while others were too brief. There were some deficiencies here, where reviewers only provided a sentence or two – therefore, both the individual reviews and panel summaries were brief. **Data Source: Jackets**	Yes – Mixed results
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? Comments: The panel summaries were consistent with the individual review comments available. Some panel summaries did not compensate for the deficiencies of the individual reviewers' comments. NSF Program Officers (POs) may need to be particularly conscientious of reviewers' interests when reviewing the proposals as some reviewers focused on their personal disciplinary interests, which appeared to bias their assessment of the proposals. The COV noted that the more interdisciplinary the proposal, the more diverse the reviewers; this sometimes appeared to make it difficult for all of the diverse reviewers to fully capture or discuss all of the complexities with the proposal.	Yes

(See COV Recommendation in Section I, Question 2.) **Background materials** • 1.4.1 Panel Summary Template • 1.4.2 GK-12 2011 Context Statement **Data Source: Jackets**	
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 an example jacket reviewed by the COV, the members noted that a funded application was apparently given the opportunity to re-write their research plan. The COV felt that it was potentially unfair that some unfunded applications were not given the opportunity to make some changes in order to receive funding. Perhaps the program staff could make more transparent to future COVs what and why re-writes may be permitted. The COV believes there should be more explanation when the PO decides to make a change regarding the funding decision – particularly when significantly different from the panel summary. The COV is interested in what drives these PO decisions. COV Recommendation: The COV believes the POs should communicate their comments and decisions to PIs – particularly when their comments differ significantly from the panel summary – with the goal to empower PIs to improve their proposal submissions. **Background materials** • 1.5.1 GK-12 2011 Context Statement **Data Source: Jackets**	Sometimes
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:	Sometimes

Some awarded proposals received the same criticisms as declined proposals, and it is unclear to the COV how these differences were distinguished. The analysis of what was well-received about the proposals remains somewhat unclear across the portfolio. COV Recommendation: Clarify – in the review analysis – the weighting of factors for recommended funding and elaborate on the decision-making process for the award/decline decision for future COV understanding. **Background materials** • 1.6.1 GK-12 2011 Context Statement **Data Source: Jackets**	
7. Additional comments on the quality and effectiveness of the program's use of merit review process: The COV is interested to know if the PO has a wider discretion in the funding decision when there are new and/or non-academic reviewers, in order to ensure that NSF/program priorities are appropriately reviewed and discussed.	

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: There was a broad range of reviewers for many of the panels in order to cover a wide range of interdisciplinary topics – this presents some challenges to the panels and NSF. For interdisciplinary panels, it may be that four reviewers are not enough to cover all topics in a meaningful manner. ***Note from Staff*: As stated in the program solicitation, a letter of intent (LOI) was required for all proposals. The LOI must contain information related to the discipline or theme of the proposal. The LOI was used by NSF staff to guide the formation of panels and the initial selection of reviewers.** **The GK-12 program director and staff worked closely with the NSF-wide GK-12 Committee to assure an appropriate selection of disciplinary and education expertise.** **Background Materials:** • 2.1.0 Program Solicitation • 2.1.1 GK-12 Panelists 2010 **Data Source: Jackets**	Yes
2. Did the program recognize and resolve conflicts of interest when appropriate? Comments: Conflicts of interest were appropriately recognized and resolved. ***Note from Staff:* GK-12 strives, through NSF policy and processes, to ensure that any conflicts of potential conflicts are addressed.** **Background Materials** • 2.2.1 NSF COI Form 1230P • 2.2.2 Panel COI Sheet **Data Source: Jackets**	Yes

Additional comments on reviewer selection:	

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:

Overall, the program provided many helpful documents to understand the management of GK-12.

A general COV observation: Masters-only institutions were allowed to apply according to the solicitation, though none received awards in this cycle.

The COV also encourages NSF to strive to make program funding decisions (e.g., cancellation of programs) prior to sending a call for proposals and reviewers. The COV does understand that these decisions can occur without warning, but cautions against spending time reviewing proposals that cannot be funded.

***Note from Staff*: Overall management of the GK-12 program is the responsibility of a Program Director and staff located in the Division of Graduate Education (DGE). The NSF-wide GK-12 Committee, consisting of at least one person from each Directorate, assists in programmatic administration and in determining funding priorities.**

DGE GK-12 staff is also responsible for post-award management. The latter includes evaluating annual and final reports, conducting site visits, attending regional meetings, and serving the needs of funded projects. In addition, GK-12 staff is involved with coordinating program evaluation and data collection.

Background materials

Award process: please see preceding documents.
Management Oversight

- 3.1.1 GK-12 Management Plan 2011
- 3.1.2 Guidelines for the GK-12 NSF Committee

Post-award management:

- 3.1.3 GK-12.org web site
- 3.1.4 GK-12 Special Focus Meeting 2010 and PI Meeting 2012 agendas
- 3.1.5 Annual Report Guidelines
- 3.1.6 Final Report Guidelines
- 3.1.7 All GK-12 Site Visit Report Data
- 3.1.8 Abt Summary Report on Evaluation of the National Science Foundation's GK-12 program.
- 3.1.9 Power of Partnerships Chapter 1 Overview of the GK-12 Approach

2. Responsiveness of the program to emerging research and education opportunities.

Comments:

The COV cannot respond to this question given the data provided for COV review. Furthermore, this may not be applicable to GK-12.

Background materials

- 3.2.1 Opportunity for International Research Activities
- 3.2.2 GK-12 Map of International Activities

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

Comments:

Although the program provides a statement regarding institutional type, new PIs, and demographic priorities, the COV felt that it did not have enough information to fully judge the program's planning and prioritization process.

***Note from Staff*: The GK-12 program staff participated in a series of discussions throughout the year both within DGE and with the GK-12 Committee, and with the EHR leadership regarding future directions for the program and responsiveness to NSF and national priorities. The program developed on-going and lasting relationships with other programs, organizations, and agencies in order to better leverage the impact of the program.**

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

Comments:

Generally, the program has been responsive to the previous COV's recommendations.

This COV agreed with the previous COV's recommendation to include webinar training with specific examples (of what activities are acceptable to meet program expectations, but not too narrowly define those activities so as to stifle innovation) for reviewers. The COV encourages NSF to continue to develop the reviewer webinar *with specific examples for reviewers*.

Previous COVs also discussed an overrepresentation of awards in the biology discipline and an underrepresentation in the disciplines of math and engineering. NSF awards for the next funding cycle were more distributed across other disciplines.

Background materials

- 3.4.1 2011 COV Report GK-12
- 3.4.2 Response to 2011 COV Report.GK-12

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: It appears that FY10 awards took the recommendation of previous COVs into account and were more widely distributed across disciplines without an overrepresentation in biology. ***Note from Staff*: The GK-12 program encouraged a broad and diverse portfolio, as evidenced by the breadth of the projects' themes as well as the support across NSF directorates.** **GK-12 hosts a dynamic and informative website. One of the features is a search capability that allows projects to be sorted by main disciplines and subdisciplines as well as the types and levels of schools that are institutional partners. On this site, information may be found concerning areas of intense/strategic focus – specifically cyberinfrastructure, nanoscience, and international engagement. See www.gk12.org** **Background Material** • 4.1.1 Description of the GK-12 FY 2011 Competition and Portfolio	Appropriate
2. Are awards appropriate in size and duration for the scope of the projects? Comments: Yes, the awards' size and duration appeared appropriate. ***Note from Staff*: As stated in the program solicitation, the award size and duration was set at $3 M for five years. In FY 2011, following termination of the program, only six awards were made at reduced amount and duration.** **Background Material** • 4.2.1 Size and Duration of Awards	Appropriate
3. Does the program portfolio include awards for projects that are innovative or potentially transformative?	Not Applicable

Comments: It is somewhat difficult to tell if the portfolio's projects were actually innovative and potentially transformative as the program is only seven years old. That said, the choice of projects certainly seemed potentially transformative at the time they were funded. The COV looks forward to a future NSF report of the transformations that actually resulted from this program; these should be shared widely in the graduate education community. The real measure of this question will include a review of program outcomes, which falls outside the scope of the COV. ***Note from Staff*: The nature of the GK-12 program, taking leading-edge research into K-12 classrooms, is in itself transformative. Training graduate students to communicate science to broad audiences, to think about how people learn, and to realize what is involved in building interest and understanding in science is novel. Exposing students and teachers to the way discoveries happen, how real science is done, and what scientists do is innovative. Please see ejackets for award information.** **Background Material** 4.3.1 Three NSF-Approved Highlights	
4. Does the program portfolio include inter- and multi-disciplinary projects? Comments: GK-12 projects are inherently interdisciplinary as it is a program requirement. ***Note from Staff*: GK-12 had as a part of the solicitation the requirement that all projects demonstrate interdisciplinarity. This is evidenced in the portfolio by the breadth and the themes encompassed by GK-12 projects and the reach of the projects across NSF directorates.** **Background material** 4.4.1 Co-Funded GK-12 Awards	Appropriate
5. Does the program portfolio have an appropriate geographical distribution of Principal Investigators? Comments: Yes, awards are reasonably distributed geographically, but with such a small number of awards it is difficult to demonstrate wide geographic distribution. **Background Materials** • 4.5.1 GK-12 2011 Proposals by State • 4.5.2 Map of GK-12 Sites Before FY2011 Competition • 4.5.3 Geographical Distribution of GK-12 Awards made in FY 2011	Appropriate

(highlighted)	
6. Does the program portfolio have an appropriate balance of awards to different types of institutions? Comments: Yes, the program portfolio has an appropriate balance of awards from different types of institutions. However, no Masters institutions were awarded in this cycle. **Background Material** • 4.6.1 Awards to Different Types of Institutions (highlighted)	Appropriate
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: 16% were new investigators (1 in 6) – the COV feels this is an appropriate balance. **Background material** • 4.7.1 Awards to New Investigators (highlighted)	Appropriate
8. Does the program portfolio include projects that integrate research and education? Comments: Yes, it is part of the GK-12 program's definition/goals to include projects that integrate research and education. **Data Source: Jackets**	Appropriate
9. Does the program portfolio have appropriate participation of underrepresented groups[1]? Comments:	Appropriate

[1] NSF does not have the legal authority to require principal investigators or reviewers to provide demographic data. Since provision of such data is voluntary, the demographic data available are incomplete. This may make it difficult to answer this question for small programs. However, experience suggests that even with the limited data available, COVs are able to provide a meaningful response to this question for most programs.

Yes, there was clear attention given to underrepresented groups; however, the COV observed that the reviews seemed to focus on whether the partner K-12 schools served underrepresented minority (URM) groups. The COV strongly supports diversity efforts and a focus on "schools in need," but it was unclear whether this particular focus was consistent with the program's broad objectives. COV Recommendation: If possible, annual reports for the remaining projects should include data on the minority status of teachers and fellows impacted by the awards as this information would provide helpful outcome information.	
10. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports. Comments: The GK-12 program aligns with the national priorities expressed by Performance Goals T-2 and T-3 (under the Strategic Goal "Transform the Frontiers") in the *NSF Strategic Plan for Fiscal Years 2011-2016*: *T-2: Prepare and engage a diverse STEM workforce motivated to participate at the frontiers.* *T-3: Keep the United States globally competitive at the frontiers of knowledge by increasing international partnerships and collaborations.* Additionally, the program addresses the importance of strengthening teachers at all levels – a critical, national concern.	Appropriate
11. Additional comments on the quality of the projects or the balance of the portfolio:	

OTHER TOPICS

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

   See above.

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.

   N/A

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

There does not seem to be a follow-on program to GK-12. Does the agency see value in such activities?

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

   As stated above, the COV would like to reiterate its recommendation for the POs to communicate their comments and decisions to the PIs – particularly when those comments differ significantly from the panel summary – with the goal to empower PIs to improve their proposal submissions.

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

   The online eCOV portal presented some difficulties for the COV. The eJackets and eJacket COV Module are easy to navigate, but there were early problems with log-in, that were subsequently fixed. The COV wanted to peruse as many of the files as possible prior to our meeting.
   The COV would have preferred to view a live presentation, rather than just a webinar.
   The COV also encourages NSF to reach out to COV reviewers further in advance for scheduling.
   The COV would like greater clarity on materials to review/prepare prior to coming to NSF.

SIGNATURE BLOCK:

Karen L Klomparens

March 23, 2015

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Dr. Karen Klomparens, Chair

For the 2014 IGERT/GK-12 COV

FY 2014 REPORT TEMPLATE FOR NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: December 15-16, 2014

Program/Cluster/Section: Integrative Graduate Education and Research Traineeship (IGERT)

Division: Division of Graduate Education (DGE)

Directorate: Directorate for Education and Human Resources (EHR)

Number of actions reviewed:

Awards: 2011 (5), 2012 (7), 2013 Core (4), 2013 CIF21 (3)

Declinations: 2011 (9), 2012 (14), 2013 Core (18), 2013 CIF21 (5)

Other: 2011 Preproposals (10 total; 3 invited, 7 not invited)

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

Awards: 2011 (18), 2012 (18), 2013 Core (4), 2013 CIF21 (3)

Declinations: 2011 (82), 2012 (136), 2013 Core (154), 2013 CIF21 (51)

Other: 2011 Preproposals: 403 total preproposals, 104 invited, 299 not invited

Manner in which reviewed actions were selected:

A total of 75 actions were selected for review. Only the FY 2011 competition required the submission and review of preliminary proposals. Ten (10) preproposal actions were selected for review. The remaining 65 actions were distributed among the four (4) full proposal competitions [FY 2011, 2012, and 2013 (Core and CIF21)] based on their relative contribution to total number of full proposals (466).

FY 2011 Preproposals: Ten (10) actions were sampled. Two (2) “invited” and seven “not invited” to submit a full proposal were selected by choosing preproposals ending in the number “2”. When more than enough proposals were found, the proposals with the lowest overall numbers were selected. One additional “invited” proposal was selected to represent a preproposal that was invited to submit a full proposal and was ultimately selected for an award.

FY 2011 Full Proposals: Fourteen (14) actions were sampled (5 awards and 9 declines) by choosing proposals that ended in the number “2”, “6”, “9” and “1” until a sufficient number of proposals were identified in each category. If more than enough proposals were found, the proposals with the lowest overall numbers were selected.

FY 2012 Full Proposals: Twenty-one (21) actions were sampled (7 awards and 14 declines) by choosing proposals that ended in the number “2”, “6”, “9” and “1” until a sufficient number of proposals were identified in each category. If more than enough proposals were found, the proposals with the lowest overall numbers were selected.

FY 2013 Full Proposals (Core): Twenty-two (22) actions were sampled. The sample included all 4 awards and 18 declines. The declines were sampled by choosing proposals that ended in the number “2”. If more than enough proposals were found, the proposals with the lowest overall numbers were selected.

FY 2013 Full Proposals (CIF21): Eight (8) actions were sampled. The sample included all 3 awards and 5 declines. The declines were sampled by choosing proposals that ended in the number “2”. If more than enough proposals were found, the proposals with the lowest overall numbers were selected.

COV Membership

	Name	Affiliation
COV Chair or Co-Chairs:	Karen Klomparens	Michigan State University
COV Members:	Lori Bruce	Mississippi State University
	Robin Garrell	UCLA
	Alfonso Ortega	Villanova University
	Anu Ramaswami	University of Minnesota
	Henry Williams	Florida A&M 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 were appropriate. ***Note from Program Staff:*** The review method for all IGERT proposals is panel review. Background materials were selected as examples of the preparation process for developing panels, assigning panelists to panels and to proposals, orienting panelists to the program and the panel process. This was developed to ensure a high quality interdisciplinary review of all proposals at all stages of the competition. **Background Materials** 1.1.1 Management Plan FY 2011 Competition (Core) 1.1.2 Management Plan FY 2012/2013 Competitions(Core) 1.1.3 Management Plan FY 2013 (CIF21) Competition 1.1.4 IGERT Coordinating Committee Panel Procedures (sample) 1.1.5 Panelist Invitation Letter (sample) 1.1.6 Pre-Panel Email #1(sample) 1.1.7 Conflict of Interest Statement for Panelists 1.1.8 Conflict-of-Interest and Confidentiality Statement for NSF Panelists (Form 1230P) 1.1.9 Panelist Webinar Invitation Email (sample) 1.1.10 Webinar Orientation PowerPoint Slides (sample) 1.1.11 Webinar Orientation Script (sample) 1.1.12 Pre-Panel Email #2 (sample) 1.1.13 IGERT Additional Review Criteria 1.1.14 GERT Proposal Review Panel Agenda (sample)	Yes

2. Are both merit review criteria addressed a) In individual reviews? b) In panel summaries? c) In Program Officer review analyses? Comments: The merit review criteria were addressed in individual reviews, panel summaries, and Program Officer (PO) review analyses. ***Note from Program Staff:*** Please see e-Jackets for examples of panelist reviews and panel summaries. Background materials were selected as examples of the preparation work for the panelists to aid in ensuring both the individual reviews and panel summaries addressed both merit review criteria. **Background Materials** 1.2.1 Pre-Panel Email #1(sample) 1.2.2 Panelist Webinar Invitation Email (sample) 1.2.3 Webinar Orientation PowerPoint Slides (sample) 1.2.4 Webinar Orientation Script (sample) 1.2.5 Pre-Panel Email #2 (sample) 1.2.6 IGERT Additional Review Criteria **Data Source: Jackets**	Yes
3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals? Comments: Most of the individual reviewers' comments were substantive, but some comments were thin. There were some that were quite expansive and others that were too brief. Occasionally, the reviewers' comments did not reflect the definition of the section (Intellectual Merit, Broader Impacts, etc) being reviewed – though their comments were valid, they may be better suited to a different section that does not specifically address the merit review criteria. The most informative reviews are those that effectively encapsulate their comments on each of the merit review criteria, in particular the program-specific criteria. <u>COV Recommendation</u>: The COV recommends implementing more mandatory webinar training for reviewers, especially related to the intellectual merit and	Yes

broader impacts criteria (including examples of good/helpful and bad/unhelpful reviews) – with particular attention to the merit review criteria – in an ongoing effort to generate better reviews. This is especially important for those who are not regular NSF reviewers. ***Note from Program Staff:*** Please see e-Jackets for examples of panelist reviews. Background materials were selected as examples of the preparation work for the panelists to aid in ensuring individual reviews provide substantive comments to explain the assessment and recommendation provided. **Background Materials** 1.3.1 Pre-Panel Email #1(sample) 1.3.2 Panelist Webinar Invitation Email (sample) 1.3.3 Webinar Orientation PowerPoint Slides (sample) 1.3.4 Webinar Orientation Script (sample) 1.3.5 Pre-Panel Email #2 (sample) 1.3.6 IGERT Additional Review Criteria **Data Source: Jackets**	
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? Comments: In some of the panel summaries, there is a detailed comment regarding the decision rationale but in others there is not a detailed comment. There was not always a synthesis of the individual aspects of the proposal that, together, would explain the bottom line. ***Note from Program Staff:*** Please see e-Jackets for examples of panel summaries. Background materials were selected as examples of the preparation work for the panelists to aid in ensuring panel summaries provide the rationale for the panel's evaluation and consensus rating. **Background Materials** 1.4.1 Pre-Panel Email #1(sample) 1.4.2 Panelist Webinar Invitation Email (sample) 1.4.3 Webinar Orientation PowerPoint Slides (sample) 1.4.4 Webinar Orientation Script (sample) 1.4.5 Pre-Panel Email #2 (sample) 1.4.6 IGERT Additional Review Criteria **Data Source: Jackets**	Yes - Mostly

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: The COV thought there was an occasional disconnect between the panel consensus and the PO consensus that was not thoroughly explained in the review analysis. Additionally, the COV is unclear if appropriate information is communicated to the PI. For example, it was unclear how the international component piece of the proposal was taken into consideration when determining whether or not to fund. ***Note from Program Staff:*** Please see e-Jackets for examples of context statements, panel reviews, panel summaries, Program Officer review analyses, and diary notes. **Background Materials** 1.5.1 Context Statement (FY 2011 Core) 1.5.2 Context Statement (FY 2012 Core) 1.5 3 Context Statement (FY 2013 Core) 1.5.4 Context Statement (FY 2013 CIF21) **Data Source: Jackets**	Yes – Mostly
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: COV Recommendation: Where appropriate, the COV thinks the program should consider including some of the more specific comments from the PO's review analysis to be provided to the PI to help explain a funding decision. ***Note from Program Staff:*** Please see e-Jackets for examples of context statements, panel reviews, panel summaries, Program Officer review analyses, and diary notes. **Background Materials**	Yes

1.6.1 Context Statement (FY 2011 Core) 1.6.2 Context Statement (FY 2012 Core) 1.6.3 Context Statement (FY 2013 Core) 1.6.4 Context Statement (FY 2013 CIF21) **Data Source: Jackets**	
7. Additional comments on the quality and effectiveness of the program's use of merit review process: COV Recommendation: Enhance reviewers'/panels' comments by requesting that reviewers define which factors/criteria were most influential in determining a proposal's rating. Additionally, the COV thinks it would be helpful if reviewers provided an overall impact statement and/or score to clearly describe what drove their recommendation/decision. COV Recommendation: Increase the transparency in how a decision is reached: the synthesis of key factors that led to an award decision – both among reviewers and POs. COV Recommendation: To the extent that it is possible and appropriate, NSF should consider sharing some of the key/award decision information from the review analyses with the PIs. • For example: Provide a more holistic description of NSF's and panelists' comments, particularly when a PO's response is significantly different than the panel summary.	

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: NSF invites other federal staff and other non-academic members of the field to review applications, and their reviews are often less helpful to this COV committee than the academic reviewers' comments. COV Recommendation: The role of the other federal staff/experts should be more clearly defined by NSF prior to the proposal reviews so that their comments are also better understood by the community and explicitly address the areas where their perspective/expertise is applicable. ***Note from Program Staff:*** As IGERT is an interdisciplinary graduate research and education training program, the proposals are expected to be interdisciplinary and thus require reviewers with backgrounds and expertise spanning the range of disciplines in the proposals assigned to the panel. This is accomplished through the identification of panel themes/topics areas and the selection of panelists. **Background Materials** Proposal jackets in e-Jacket contain demographic information on the background, expertise, and institutional affiliation of the panelists. **Data Source: Jackets**	Yes
2. Did the program recognize and resolve conflicts of interest when appropriate? Comments: Conflicts of interest were appropriately recognized and resolved. ***Note from Program Staff:*** Please refer to the documentation in e-Jacket for specific information. The background material has been provided to illustrate how the IGERT management team identifies and handles any conflicts or potential conflicts of interests.	Yes

Background Materials 2.2.1 Conflict of Interest Statement for Panelists 2.2.2 Conflict-of-Interest and Confidentiality Statement for NSF Panelist (Form 1230P) **Data Source: Jackets**	
Additional comments on reviewer selection: The COV noted that major research institutions were encouraged to partner with smaller research institutions or Minority-Serving Institutions (MSIs) on their applications. The COV is interested to know if PIs from smaller research institutions or MSIs were specifically recruited to serve on review panels. The 2011 solicitation states this recruitment is a goal of the program, and the COV is interested in data to demonstrate if this goal was successfully met. COV Recommendation: The COV suggests the program provide data on efforts made to increase participation of reviewers from a large geographic distribution – particularly reviewers from states that have submitted many proposals but may not have a high success rate.	

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:

Overall, the program provided many helpful documents to understand the management of IGERT.

The COV noted a previous 2011 COV recommendation (#10) and the program's response (see below) with ongoing interest and concern.

> **"2011 COV Recommendation #10.** Disaggregate data to know whether underserved minorities are successfully recruited and retained.
> **Program Response:** This recommendation is a very good next step in our use of the collected data. We will connect this analysis to our review of partnerships with minority serving institutions.
> 2013 Update: We have initiated discussions with the National Center for Science and Engineering Statistics (NCSES) to improve information on retention and time to graduation of IGERT students. We will include results for underrepresented minority students in our analysis."

The COV is interested to know if the NSF has finished their data collection and analysis to determine if, in fact, underserved minority students have been successfully recruited and retained. If successful, the COV is interested in the determinants of such success.

The COV understands that budget cutbacks have resulted in fewer site visits and would like to know if this has impacted the effectiveness of program evaluation.

The COV encourages NSF to continue to provide support for ongoing management and evaluation of IGERT. The graduate education community is very interested in an outcomes summary of promising practices, including those for minority student recruiting, and the impact on interdisciplinary graduate program numbers and institutionalization.

Note from Program Staff:
IGERT is managed by the Division of Graduate Education with assistance from representatives from all NSF Directorates. The Management Plans for each competition describe the role of the IGERT Coordinating Committee as well as how proposals are reviewed and how projects are managed post-award.

Background Materials

3.1.1 Management Plan FY 2011 Competition (Core)
3.1.2 Management Plan FY 2012/2013 Competitions (Core)
3.1.3 Management Plan FY 2013 (CIF21) Competition
3.1.4 Pre-Panel Email #1(sample)

3.1.5 Panelist Webinar Invitation Email (sample)
3.1.6 Webinar Orientation PowerPoint Slides (sample)
3.1.7 Webinar Orientation Script (sample)
3.1.8 Pre-Panel Email #2 (sample)
3.1.9 IGERT Additional Review Criteria
3.1.10 2011-2013 Award List
3.1.11 2011-2013 Award Map
3.1.12 2011-2013 IGERT Themes and Directorates
3.1.13 IGERT.org Web Site Screen Shot
3.1.14 IGERT 2012 Project Meeting Agenda
3.1.15 IGERT 2011 PI Orientation Meeting
3.1.16 IGERT 2012 PI Orientation Meeting
3.1.17 Annual and Final Report Process/Instructions (sample)
3.1.18 Annual and Final Report Webinar (sample)
3.1.19 Abt Evaluation Report: Essential Competencies for Interdisciplinary Graduate Training: Summary Report
3.1.20 Abt Evaluation Report: Essential Competencies for Interdisciplinary Graduate Training: Final Report
3.1.21 IGERT Annual Report 2012 (internal): Advancing Interdisciplinary Research and Graduate Education: Recent Outcomes of the NSF IGERT Program
3.1.22 IGERT Monitoring System: PI and Trainee Survey Questions and Data Fields

2. Responsiveness of the program to emerging research and education opportunities.

Comments:

Most successful IGERT awards are focused on new and emerging areas. It is a goal of the program to change graduate education culture into more interdisciplinary fields.

However, it is not clear to the COV how NSF defines emerging fields. Is it an internal discussion within EHR and among other NSF directorates, research from the field, input from institutions, input from the review panels, all of these? Clarification for the investigators would be helpful, and more transparent, for future NSF programs. The COV also supports PIs having the freedom to creatively explore new ideas at the intersection of disciplines.

As the COV read various reviewers' comments, it was apparent that the value of diversity of disciplines that are proposed for integration is recognized.

COV Recommendation: For future fellowship programs and opportunities, the COV encourages DGE to talk with other divisions/directorates on new/emerging research opportunities utilizing existing internal structures, such as the IGERT Coordinating Committee. (This could be driving identification of emerging areas behind the scenes, but this is not easily visible to the COV.)

Background Materials

3.2.1 NSF Strategic Plan 2011-2016
3.2.2 NSF 12-555 IGERT CIF21 Solicitation (FY 2013)
3.2.3 2011-2013 Award List
3.2.4 2011-2013 IGERT Themes and Directorates

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

Comments:

Though the program does provide a statement regarding institutional type, new PIs, and demographic priorities, the COV felt that it did not have enough information to fully judge the program's planning and prioritization process.

It was clear that the program prioritized and created the cyber-IGERT segment in an effort to respond to the NSF-wide initiative.

Background Materials

3.3.1 NSF 10-523 IGERT Solicitation (FY 2011)
3.3.2 NSF 11-533 IGERT Solicitation (FY 2012/2013)
3.3.3 NSF 12-555 IGERT CIF21 Solicitation (FY 2013)
3.3.4 Management Plan FY 2011 Competition (Core)
3.3.5 Management Plan FY 2012/2013 Competitions (Core)
3.3.6 Management Plan FY 2013 (CIF21) Competition
3.3.7 Pre-Panel Email #1(sample)
3.3.8 Panelist Webinar Invitation Email (sample)
3.3.9 Webinar Orientation PowerPoint Slides (sample)
3.3.10 Webinar Orientation Script (sample)
3.3.11 Pre-Panel Email #2 (sample)
3.3.12 IGERT Additional Review Criteria
3.3.13 2011-2013 Award List
3.3.14 2011-2013 Award Map
3.3.15 2011-2013 Themes and Directorates

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

Comments:

The program has been responsive to the previous COV's recommendations, but it is unclear if the changes from COV recommendations have been beneficial.

Field experts/non-academic reviewers were added to panels due to the COV's recommendation, but it's not clear whether they have added value to the review process.

As noted in the COV Recommendation on page 8, the COV recommends providing the non-academic reviewers specific information and guidance that can be used to focus their reviews and add value because of their perspective and areas of expertise.

As noted on page 10, the COV would like some additional information regarding NSF's approach and research on how to increase, recruit, and retain the number of minority students. It is clear that NSF is responding to the previous COV's recommendation, and this COV encourages NSF to provide data to demonstrate their efforts in this area.

COV Recommendation: As the IGERT program is being sunsetted, the NSF should consider conducting a retrospective assessment to elucidate strategies that have worked in recruiting and retaining minorities. There is still valuable information that can be collected and shared with the

community. Again, we encourage NSF to support the management and evaluation of IGERT to provide a summary to the graduate education community.

Background Materials

3.4.1 2010 COV Report
3.4.2 Staff Response to 2010 COV Report

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: Yes. The COV is interested to know whether the portfolio's balance of awards across disciplines changed significantly during FY12 and FY13, and if any change was a possible unanticipated consequence of the decision to remove the pre-proposal process. For example, were institutions more conservative when selecting the one proposal to submit to NSF or did they chose "trendy" topics or topics that they perceived were of particular interest to the NSF versus truly novel topics? COV Recommendation: The NSF should consider analyzing whether the breadth of individual proposals or the proposals as a whole narrowed as a result of the limited submission process. ***Note from Program Staff:*** The IGERT Solicitation includes the requirement that all projects demonstrate interdisciplinarity. This is evidenced in the portfolio by the breadth of the themes present in IGERT projects and inclusion of research supported by a range of NSF Divisions and Directorates. The background information provided illustrates these points. **Background Materials** 4.1.1 2011-2013 IGERT Themes and Directorates	Appropriate
2. Are awards appropriate in size and duration for the scope of the projects? Comments: Yes, the awards' size and duration appeared appropriate. ***Note from Program Staff:*** Per the solicitation, IGERT awards are very similar in size and duration -$3M over 5 years. Differences in budgets are largely a consequence of optional funding opportunities, including international activities.	Appropriate

Background Materials 4.2.1 2011-2013 Average Award Size and Duration Table	
3. Does the program portfolio include awards for projects that are innovative or potentially transformative? Comments: Yes, overall the portfolio includes projects that are innovative and potentially transformative. ***Note from Program Staff:*** Per the solicitations, each IGERT project is required to integrate research and education. Therefore, the program portfolio includes projects that are based on cutting-edge interdisciplinary research linked with innovative interdisciplinary graduate education. The background material was selected to provide data illustrating the integration of research and education both within each IGERT and across the entire portfolio. **Background Materials** 4.3.1 NSF 10-523 IGERT Solicitation (FY 2011) 4.3.2 NSF 11-533 IGERT Solicitation (FY 2012/2013) 4.3.3 NSF 12-555 IGERT CIF21 Solicitation (FY 2013) **Data Source:** Jackets	Appropriate
4. Does the program portfolio include inter- and multi-disciplinary projects? Comments: Yes, it is the purpose of the IGERT program to include inter- and multi-disciplinary projects. ***Note from Program Staff:*** The IGERT Solicitation requires that all projects demonstrate cutting-edge interdisciplinary STEM research linked with innovative graduate education. The background material was selected to provide evidence of how IGERT is meeting these requirements **Background Materials** 4.4.1 NSF 10-523 IGERT Solicitation (FY 2011) 4.4.2 NSF 11-533 IGERT Solicitation (FY 2012/2013) 4.4.3 NSF 12-555 IGERT CIF21 Solicitation (FY 2013) 4.4.1 2011-2013 Themes and Directorates	Appropriate

5. Does the program portfolio have an appropriate geographical distribution of Principal Investigators? Comments: There is some geographic distribution within the program portfolio, but many awards are concentrated in the Northeast as many large research institutions are located there. The COV feels geographic distribution should be reviewed further. The IGERT distribution of awards to MSIs and involvement of underrepresented groups overall were both somewhat poor. The NSF management report noted that NSF is continuing to work on this area by encouraging partnerships with majority institutions with MSIs. • The COV would like additional data to determine if this bridge partnership has this been fully implemented and if it has it been successful. COV Recommendation: The COV encourages the program to provide data regarding the proposals submitted by state as well as the success rate by state in order to more effectively respond to this question. ***Note from Program Staff:*** The IGERT program strives for balance along a number of dimensions, including geographic, institution type, gender, race and ethnicity. All dimensions are taken in the context of the panel recommendations based on the review criteria for Intellectual Merit and Broader Impacts. The background materials were selected to provide information on the geographical distribution of awards during the period under review. **Background Materials** 4.5.1 2011-2013 Award List 4.5.2 2011-2013 Award Map	Appropriate – Mostly
6. Does the program portfolio have an appropriate balance of awards to different types of institutions? Comments: 21% of IGERT awards were made to institutions in EPSCoR states, but the COV members are unaware of the significance of this percentage and particularly would like to compare IGERT's percentage to other NSF programs across the directorate. ***Note from Program Staff:*** The IGERT program strives for balance along a number of dimensions, including geographic, institution type, gender, race and ethnicity. All dimensions are taken in the context of the panel recommendations based on the review criteria for Intellectual Merit and Broader Impacts. The background materials were selected to provide information on the distribution of awards	Appropriate

among institutions during the period under review. **Background Materials** 4.6.1 2011-2013 Award List 4.6.2 2011-2013 Award Map 4.6.3 2011-2013 IGERT Award Portfolio Analysis	
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: Typically, first-time PIs do not fare particularly well. However, IGERT has a relatively high number of new PIs, which is laudable. The COV noted that it may be an unintended consequence of limited submissions to have fewer new/first-time investigators receive funding. The COV noted that it is possible new investigators may be unintentionally filtered out by the institutional review process to select only one application to submit to NSF. This should be considered for ongoing programs such as the NSF Research Traineeship Program (NRT). ***Note from Program Staff:*** IGERT awards are for ~ $3,000,000 for 5 years. Thus, the appropriateness of the PI and co-PIs of the award is a critical part of the review of the intellectual merit of the proposal. It is therefore unlikely that an IGERT PI would be a young researcher or untenured Assistant Professor. New IGERT PIs typically have a history of NSF funding. Yet, prior NSF funding is not a review criterion in the IGERT Program. **Background Materials** 4.7.1 2011-2013 Average Award Size and Duration Table	Appropriate
8. Does the program portfolio include projects that integrate research and education? Comments: Yes. It may be useful to determine the emerging areas of research that the program would like to stimulate. ***Note from Program Staff:*** Per the solicitation, each IGERT project is required to integrate research and education. Therefore, the program portfolio includes projects that are based on cutting-edge interdisciplinary research linked with innovative interdisciplinary graduate education. The background material was selected	Appropriate

to provide data illustrating the integration of research and education both within each IGERT and across the entire portfolio. **Background Materials** IGERT Solicitations: 4.8.1 NSF 10-523 IGERT Solicitation (FY 2011) 4.8.2 NSF 11-533 IGERT Solicitation (FY 2012/2013) 4.8.3 NSF 12-555 IGERT CIF21 Solicitation (FY 2013) **Data Source:** Jackets	
9. Does the program portfolio have appropriate participation of underrepresented groups[1]? Comments: COV Question: Did recent awardees have a bridge program with MSIs as an option as noted in the FY11 management plan? COV Recommendation: There is a need for outcome assessments in order to understand how minority recruitment and retention was enhanced (or if it was enhanced) by MSI bridges with large research entities. What are the data on MSIs linked with large research schools, versus other IGERTs that used other strategies or other partnerships? Additionally, the COV is interested in whether NSF evaluates the actual participation and meaningful contribution of MSI partnerships within a proposal once an award is made. **Background Materials** 4.9.1 2011-2013 Award List 4.9.2 2011-2013 IGERT Award Portfolio Analysis	Appropriate – Mostly
10. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports. Comments: The IGERT program aligns closely with the national priorities expressed by Performance Goals T-1, T-2, and T-3 in the *NSF Strategic Plan for Fiscal Years 2011-2016*: *T-1: Make investments that lead to emerging new fields of science and engineering and shifts in existing fields.*	Appropriate

[1] NSF does not have the legal authority to require principal investigators or reviewers to provide demographic data. Since provision of such data is voluntary, the demographic data available are incomplete. This may make it difficult to answer this question for small programs. However, experience suggests that even with the limited data available, COVs are able to provide a meaningful response to this question for most programs.

T-2: Prepare and engage a diverse STEM workforce motivated to participate at the frontiers. *T-3: Keep the United States globally competitive at the frontiers of knowledge by increasing international partnerships and collaborations.* The COV appreciates that the IGERT team encourages PIs to creatively, and with foresight, outline emerging priority areas. **Background Materials** 4.10.1 NSF Strategic Plan 2011-2016 **Data Source: Jackets**	
11. Additional comments on the quality of the projects or the balance of the portfolio: The COV recognizes that the program is still collecting information from current grantees to document the best practices/lessons learned from the IGERT program. As graduate programs have added interdisciplinary programs, the COV is interested to know if any graduate program changes can be directly connected to IGERT – have there been any permanent institutional changes and have IGERT-established programs/disciplines continued after NSF funding expires? This information would also help inform future review processes for interdisciplinary grants.	

OTHER TOPICS

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

   See above

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.

   See above

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

As noted in the COV Recommendation on page 8, the COV recommends providing the non-academic reviewers specific information and guidance that can be used to focus their reviews and add value because of their perspective and areas of expertise.

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

   If partnerships, such as the MSI bridges, are viewed as valuable, might that be an explicit component to add to future RFPs, with defined activities and explicit assessment metrics?

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

   The online eCOV portal presented some difficulties for the COV. The eJackets and the eJacket COV Module are easy to navigate, but there were early problems with log-in, that were subsequently fixed. The COV wanted to peruse as many of the files as possible prior to our meeting.
   The COV would have preferred to view a live presentation, rather than just a webinar.
   The COV also encourages NSF to reach out to COV reviewers further in advance for scheduling.
   The COV would like greater clarity on materials to review/prepare prior to coming to NSF.

SIGNATURE BLOCK:

Karen L Klomparens

March 23, 2015

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Dr. Karen Klomparens, Chair
For the 2014 IGERT/GK-12 COV

FY 2014 REPORT TEMPLATE FOR NSF COMMITTEES OF VISITORS (COVs)

The table below should be completed by program staff.

Date of COV: December 15-16, 2014
Program/Cluster/Section: CyberCorps®: Scholarship for Service (SFS)
Division: Division of Graduate Education (DGE)
Directorate: Directorate for Education and Human Resources (EHR)
Number of actions reviewed: **Awards: 30** **Declinations: 21** **Other:**
Total number of actions within Program/Cluster/Division during period under review: Awards: 88 [2011 (20), 2012 (43), 2013 (25)] Declinations: 253 [2011 (47), 2012 (117), 2013 (89)] **Other:**
Manner in which reviewed actions were selected: A combination of random sampling techniques were employed to select the 51 proposals for the SFS COV review. The selection methodology was as follows: The COV Chair was asked to pick three single-digit numbers (2, 6, 9), which were then used to create a sample of proposals from each of the three fiscal years (2011, 2012 and 2013) by pulling proposals with IDs ending with one of the corresponding numbers. For cases in which a non-lead proposal was selected, the lead proposal of the collaborative set replaced the selected proposal. Approximately 15% of the proposals from each fiscal year were sampled, 60% of which were awards and 40% declines. If the selection produced by the digit-based method was not sufficiently large, a random number generator was used to assign each proposal a four-digit number. Proposals with the lowest random numbers were then added until the 15% threshold was satisfied.

COV Membership

	Name	Affiliation
COV Chair or Co-Chairs:	Dr. Karen Klomparens Dr. Loretta A. Moore	Michigan State University Jackson State University
COV Members:	Mr. Steven Hernandez Dr. Heather M. Prather Mr. W. Hord Tipton	U.S. Department of Health and Human Services U.S. Office of Personnel Management International Information Systems Security Certification Consortium, Inc., $(ISC)^2$

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? Yes Comments: The use of panels for the review of proposals is very appropriate. This review method allows ample time for the prior review of proposals and facilitates onsite discussion of each proposal by a diverse group of reviewers. All processes appear to be in order with good documentation, detailed reviews, and panel summaries. The panelist introduction package was well organized, provided detailed information regarding travel logistics and criteria for reviewing proposals, and encouraged quality reviews in alignment with NSF's two merit review criteria. **Background Material: I. Merit Review (Panelist Intro Package, Webinar, Orientation etc.)** **Data Source: I. Merit Review (Selected Jackets)**	Yes
2. Are both merit review criteria addressed a) In individual reviews? Yes. b) In panel summaries? Yes.	Yes

c) In Program Officer review analyses? Yes Comments: The individual reviewers addressed both merit review criteria. Overall, the individual reviewers provided thorough and thoughtful reviews. Strengths were consistently addressed; however in some cases weaknesses were sparse. The panel summaries addressed both merit review criteria; however the thoroughness varied. Some were very short, and some others used exact passages from the reviews. Overall, these summaries did an excellent job of integrating the individual reviewer's comments and concerns, providing practical considerations in implementation of the activities and evaluation of the outcomes, and providing suggestions of what to address in the case of future re-submissions. The Program Officer (PO) provided thorough review analyses addressing both intellectual merit and broader impact review criteria. Some jackets contained statements alluding that the panel's narrative did not match their rating. It was also noted by the COV that a few decisions for funding were based on the judgment of the PO and were not consistent with the ratings. There was further explanation in these instances. **Background Material: I. Merit Review (Panelist Intro Package, Webinar, Orientation etc.)** **Data Source: I. Merit Review (Selected Jackets)**	

3. Do the individual reviewers giving written reviews provide substantive comments to explain their assessment of the proposals? Yes, for the most part. Comments: The majority of the reviewers provided substantive comments to explain their assessment. Some comments were quite brief and/or did not contain ample feedback in order for Principal Investigators to understand what revisions would be helpful in future re-submissions. If program maturity is used as criteria for declination of a proposal, ample explanation of these weaknesses should be provided. Greater attention needs to be paid to the justification of the rating. COV Recommendation: Provide adequate staffing of panels (i.e., science assistants) to ensure that the text of reviews corresponds to the rating. Continue training of panelists through pre-webinar, panelist introduction package, and onsite presentation to ensure consistent and thorough reviews. **Data Source: I. Merit Review (Selected Jackets - see individual reviews)**	Yes

4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?	Yes

Yes Comments: The panel summaries provided a summary of the intellectual merit and broader impacts of the proposal, which indicates the rationale for the panel's recommendation. Concerns raised by the panel were also included for the majority of the reviews. The panel summary did not contain a statement of the panel's recommendation. This should be addressed by the adoption of the new proposal review template, which includes sections for suggested improvements, conclusions justifying the panel's recommendations, and the panel recommendations. **Data Source: I. Merit Review (Selected Jackets - see panel summaries)**	
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.] Yes Comments: The jackets articulated strengths and weaknesses; however some did not provide suggestions for further improvement. COV Recommendation: Expand on why applications did not receive funding. Project summary should be clear as to why the project was declined. The adoption of the new proposal review template should ensure that the documentation in the jacket addresses the rationale for why applications might not receive funding. **Background Material: III. Management (Context Statements)** **Data Source: I. Merit Review (Selected Jackets - see review analysis)**	Yes

6. Does the documentation to the PI provide the rationale for the award/decline decision? Yes [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: The combination of individual reviews, the panel summary, the context	Yes

statement, and the program officer letter provides adequate rationale for the award/decline decision. In most cases the Program Officer letter contained a recap of the major factor(s) in the decision to decline funding. Reviewers should be encouraged to provide specific comments to support ratings, especially where proposals might not be funded. Not all declinations included a specific rationale for the decision. A suggestion of providing improvements for future submissions would be helpful in a competitive environment. There were a few jackets (3 or 4 instances) where there appeared to be some inconsistencies between the reviewers' ratings, panel summaries, and the final decisions. In some cases it appeared that some reviewers did not fully understand what they were looking for in terms of criteria. There was one specific instance where a PO recommended a low competitive proposal for funding without a sufficient rationale. After the internal review of the PO's recommendation, appropriate steps were taken to ensure that such cases include a detailed discussion and a sufficient rationale. The adoption of the new template will ensure that documentation to the PI provides the rationale for the award/decline decision. **Background Material: III. Management (Context Statements)** **Data Source: I. Merit Review (Selected Jackets - see PO comments, reviews, panel summary)**	

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? Yes Comments: The majority of reviewers brought on were pioneers/leaders in their respective fields of expertise. There was excellent use of diversity, education, and backgrounds. The majority of reviewers were from computer sciences (70%), with reviewers from other disciplines and fields making up approximately 30% of the reviewer pool. These other fields included computer education, business management, sciences, and social sciences (suggest increasing these reviewers). COV Recommendation: The last COV report recommended the pool of reviewers be enhanced to include practitioners from private industry and government. Based on the demographics of the reviewers provided, the percentage of government reviewers declined from 14.8% in FY 2011 to 4.4% in FY 2013. There were no reviewers from business/industry from FY 2011 to FY 2013. The COV recommends actively recruiting government reviewers and reviewers from organizations serving government cybersecurity needs. **Data Source: I. Merit Review (Selected Jackets); II. Reviewers (List, By Institution Type, Gender, Minority and Disability)**	Yes
2. Did the program recognize and resolve conflicts of interest when appropriate? Yes Comments: Conflicts of interest occurred and those reviewers were excused from the review. **Background Material: I. Merit Review (Panelist Intro Package, Webinar, Orientation – see COI information and forms)** **Data Source: I. Merit Review (Selected Jackets- see review analysis for COI statements)**	Yes

Additional comments on reviewer selection: COV Recommendation: Continue to increase diversity of reviewers to reflect the program's goals and needs. The program should look to diversify reviewer backgrounds to include behavioral sciences and possibly law.	

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 management of the program presents the program as well structured, repeatable, and mature. Documented processes and policies speak to the approach of the program and also the expectations of management and reviewers. There are multiple agencies and stakeholders (i.e., NSF, OPM, and ICC advisory board) involved in the management of the program, which reflects the vast and growing needs of cybersecurity and the inclusiveness of the SFS program. In addition, the on-going OPM program evaluation tracks the progress of the program and provides recommendations to the program offices to improve the program. Furthermore, by including the Interagency Coordinating Committee (ICC) advisory board, the SFS program ensures participation of experts across the federal government to address concerns in cybersecurity. NSF also leads the ICC that meets three times a year and includes agency representatives. The Job Fair is an outstanding success and the program has made significant strides in meeting diversity and quality goals. It brings together stakeholders to share ideas and research and to provide recommendations for managing the program. The current lead of the program has been a strong force in the program for many years and is highly recognized in the SFS community as providing a vision for this program. When the program was housed in the Division for Undergraduate Education (DUE) the lead only provided 25% of time to the SFS program. There were an additional four POs that provided 12-20% of time, which may have contributed to variations in recommendations. The move to the Division of Graduate Education (DGE) has, among its benefits, a greater time commitment on the part of the lead PO and the addition of a second PO at approximately 75% time, which should contribute to the program's continuity and its ability to really address the strategic initiatives. The dwell time increased overall in FY 2013 from FY 2012. The negative impacts of Government budget resolution issues contributed to the delays. COV Recommendation: Continue to provide overall staffing support to the program lead in recognition of the significance of this program to the nation's security. Increase the marketing and outreach efforts for recruitment of diverse students, minority serving institutions, and Principal Investigators from underrepresented groups. Continue to leverage relationships with all constituent groups, such as the Interagency Coordinating Committee and the SFS Job Fair, as well as the Annual Principal Investigators Meeting. **Background Material: Program Solicitations; Management Plans; Panel Emails, Webinar, Orientation Material; Processing Instructions; Portfolio tables (list, map, demographics); Program Evaluation summary; PI Annual Meeting; Job Fair; Boot Camps; MOUs.**

Data Source: III. Management; V. Evaluation; VI. Addendum

2. Responsiveness of the program to emerging research and education opportunities.

Comments:

Management has performed well in ensuring a balanced and holistic approach to information assurance. It has addressed the "technical vs. policy" question with a "people, processes, and technology" approach that redefines the "marketplace" for information assurance professionals in more realistic terms. Often, the scope of the proposals can be quite expansive. The program has allowed for niche fields to be explored while tackling larger issues.

The vast majority of the awards that were reviewed complied with the philosophy of providing a broad information assurance education while ensuring that specialized programs in more narrow fields are also addressed. The breadth of degrees awarded to SFS students at least partially reflects that intention. Moving from the Division of Undergraduate Education to the Division of Graduate Education should hopefully result in more resources to manage the program at NSF and increased responsiveness to future research and education needs.

An evaluation of the CyberCorps program recommended allowing two-year institutions to apply for scholarship grants. NSF informed the COV that a Bill is being considered which would support the inclusion of two-year institutions in future SFS grant competitions.

COV Recommendation: Broaden the types of institutions that are being funded. Looking at the institutions being funded, there were not many smaller schools or minority serving institutions.

Data Source: III. Management; V. Evaluation; VI. Addendum

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

Comments:

Given the issues of sequestration and unknown funding levels, the management team did very well in the planning and prioritization process. The program solicitations were clear in their requirements. Panel emails and webinar training were excellent resources to ensure that the reviewers were prepared for the panels. OPM's program evaluation is extremely positive regarding the management of the CyberCorps® SFS program, and agency satisfaction provides assurance that the program is performing at a high level.

Background Material: Program Solicitations; Management Plans; Panel Emails, Webinar, Orientation Material; Processing Instructions; Portfolio tables (list, map, demographics); Program Evaluation summary; PI Annual Meeting; Job Fair; Boot Camps; MOUs.
Data Source: III. Management; V. Evaluation; VI. Addendum

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

Comments:

The previous COV comments were adequately addressed. Management provided copious amounts

of explanation and hard documentation to support this position. It attentively listened and implemented the majority of recommendations of the prior COV. Specific materials for many of the prior COV recommendations were made available in the COV document repository, and management, upon request, provided additional information. Significant strides have been made in a number of areas, specifically in the areas of diversity, programs of study, and geographical distribution of awards.

Additionally, the program followed the recommendation of the last COV report and is working to increase the pool of reviewers to include practitioners from government.

Data Source: 0. COV Documents (Program Update On Actions Taken in Response to 2011 COV)

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? Yes Comments: Yes, the distribution of awards changed from FY 2011 to FY 2012 and FY 2013. In FY 2011, all of the awards were in computing; whereas in FY 2012 and FY 2013 there were awards in engineering and interdisciplinary fields, showing more diversity in awards. In FY 2013, 84% of funding was awarded to proposals in computing, representing 21% of proposal submissions. However, the funding rates in other disciplines provide evidence of the program's efforts to balance awards across disciplines and sub-disciplines: 60% of interdisciplinary proposals were awarded (out of 5) and 67% of engineering proposals were awarded (out of 3). **Data Source: IV. Portfolio**	**Appropriate**
2. Are awards appropriate in size and duration for the scope of the projects? Yes Comments: The size and duration of the awards based on solicitation requirements were appropriate. Awards granted in FY 2011-13 were nearly the same in size (~$350,000) as well as duration (~3-4 years). There was a clear mapping between the award amount and the expected performance indicators. The program management ensured that the distribution of funding between the various resources needed to complete the objectives of the proposal was adequate. To be specifically noted was the increase in funding amounts allocated to undergraduate and graduate student stipends. **Data Source: IV. Portfolio (Average Award Size and Duration)**	**Appropriate**
3. Does the program portfolio include awards for projects that are innovative or potentially transformative?	**Appropriate**

Yes Comments: Awards covered many areas ranging from traditional cybersecurity to more specialized topics such as assured cloud computing and mobile device security. In addition to the scholarship awards, capacity building awards supported curriculum development, pipeline development, and pathway development. While these efforts have benefited higher education institutions, there has also been outreach to high school students as well as civilians and military personnel. COV Recommendation: Future solicitations may consider awareness and fundamentals of information assurance as well as outreach activities for K-12. **Data Source: IV. Portfolio (List of Awards); V. Evaluation; VI. Addendum**	
4. Does the program portfolio include inter- and multi-disciplinary projects? Yes Comments: Some of the inter- and multi-disciplinary projects included offensive/defensive computing, smart grid security, industrial control systems, and critical information infrastructure. **Data Source: IV. Portfolio**	**Appropriate**
5. Does the program portfolio have an appropriate geographical distribution of Principal Investigators? Yes Comments: A map was provided to show the appropriate geographical distribution of Principal Investigators. Awards were granted to Principal Investigators located in approximately 40 states including Hawaii and Alaska. This is a positive example of capacity building across the United States rather than just in selected regions. **Data Source: IV. Portfolio (Award Distribution by Region, by State)**	**Appropriate**
6. Does the program portfolio have an appropriate balance of awards to different types of institutions?	**Appropriate**

Yes Comments: While the majority of awards were given to master's and doctorate degree granting institutions, a small number of awards were made to associate and bachelor's degree granting institutions. With a potential future focus on community colleges, there must be increased planning for bachelor's and associate level students. Approximately 80% of awards were made to public institutions. Although the number of proposals submitted by minority serving institutions increased significantly from FY11 (16) to FY12 (36), there was a slight decline in submissions from FY12 (36) to FY13 (21). There has been a steady increase in the funding rate of proposals submitted by minority serving institutions from 19% in FY11 to 29% in FY13. Outside of HBCUs and HSIs, no proposals were submitted from other MSI type institutions, i.e., Tribal Colleges and Universities, Alaska Native Serving Institutions, Native Hawaiian Serving Institutions, Pacific Islander Serving Institutions. Submissions from minority serving institutions should be a focus in future solicitations. COV Recommendation: Develop an intentional focus on increasing the number of proposals submitted by minority serving institutions. Collaborate with OPM in order to ensure direct hiring authorities include grades suitable (GS-5 through GS-7) for associate and bachelor's graduates. **Data Source: IV. Portfolio (Award Distribution by Institution Type, Minority Serving Institutions and Targeted Audience Statistics)**	
7. Does the program portfolio have an appropriate balance of awards to new investigators? Yes NOTE: A new investigator is an investigator who has not been a PI on a previously funded NSF grant. Comments: The percentage of new Principal Investigators has increased throughout the years, averaging from 4% (FY 2011) to about 20% (FY 2012 and FY 2013). The outreach activities and the workshops on how to write successful proposals may have aided the increase in the funding of proposals from new investigators. **Data Source: IV. Portfolio (Funding Rate for New Principal Investigators)**	**Appropriate**
8. Does the program portfolio include projects that integrate research and education?	**Data not Available**

Comments: There was not enough information in the description of each award to make a determination regarding how well the portfolio includes projects that integrate research and education. **Data Source: IV. Portfolio;**	
9. Does the program portfolio have appropriate participation of underrepresented groups[1]? Yes; however, see comments below. Comments: There has been a steady increase in the funding rate of proposals submitted by minority serving institutions from 19% in FY11 to 29% in FY13. Proposals submitted which included women, minorities, and pre-service teachers as targeted audiences have increased, and the funding rate has fluctuated from 23% in FY11 to 21% in FY12 to 26% in FY13. The percentage of awards where females served as PIs has declined from 40% in FY11 to 23% in FY13, and the funding rate for this population of PIs has declined from 50% in FY11 to 29% in FY13. The percentage of awards made to African-American PIs increased only slightly from 5% in FY11 and FY12 to 8% in FY13. The funding rate for this population remained steady at 25%. The number of proposals submitted by and the number of awards made to Hispanic PIs must be addressed. The funding rate for this group has declined from 50% in FY11 (with 2 proposals submitted) to 0% in FY13 (with 5 proposals submitted). The participation of these targeted populations has not been fully addressed. Both NSF and the SFS leadership recognize the possibility of gender bias in evaluations and have addressed this in the webinars. COV Recommendation: Consistent with NSF visions, we encourage the SFS team to promote strategic plans that focus on underrepresented minority individuals and institutions in order to increase submissions and potential awards. **Data Source: IV. Portfolio (Minority Serving Institutions and Targeted Audience Statistics)**	**Appropriate**

[1] NSF does not have the legal authority to require principal investigators or reviewers to provide demographic data. Since provision of such data is voluntary, the demographic data available are incomplete. This may make it difficult to answer this question for small programs. However, experience suggests that even with the limited data available, COVs are able to provide a meaningful response to this question for most programs.

10. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports. Yes Comments: SFS maps well to the National Initiative for Cybersecurity Education (NICE). The program's missions and goals are reflective of NICE, which aims to (1) raise national awareness about risks in cyberspace; (2) broaden the pool of individuals prepared to enter the cybersecurity workforce; and (3) cultivate a globally competitive cybersecurity workforce. NICE and DoD Directive 8570 work well together to match the job needs and the skill needs to SFS outcomes. COV Recommendation: Develop action plans that focus on cybersecurity focus areas (e.g., community college, diversity agency needs, portfolio needs). **Background Material: Program Solicitations** **Data Source: I. Merit Review (Selected Jackets see Annual and Final Reports); VI. Addendum**	**Appropriate**
11. Additional comments on the quality of the projects or the balance of the portfolio: Overall, the quality of the projects is impressive, and the portfolio is appropriately balanced. The SFS community has grown considerably, as indicated by the increase in the number of SFS graduates and the additional institutions that have joined the program. There is a challenge for Principal Investigators at SFS institutions and the NSF and OPM program offices to maintain communication with the different stakeholder groups and continue to collect feedback on ways to improve the program and its implementation. As the technologies surrounding cybersecurity change and the types of cybersecurity threats continue to evolve, it will be increasingly important for SFS stakeholders to reach out and share information for the collective purpose of protecting the U.S. Government's information infrastructure.	**Appropriate**

OTHER TOPICS

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

   The following observations and/or recommendations are made:

   - Create a tighter mapping of SFS performance objectives to NSF strategic plans, White House memoranda, and federal directives.

- Focus on competencies with the largest proficiency gaps while also taking into consideration their importance and NFT ratings. Computer Network Defense, in particular, was identified as a competency that is both critical to a well-prepared cybersecurity workforce and also in need of additional development in a substantial number of graduates.
- Increase the skill sets of graduates as identified from other data/information sources, i.e., NICE security competences.
- Continue to focus on the general competency skills of graduates, such as decision making, in addition to technical competencies.
- Minority serving institutions should be a focus based on the geographic increase of these populations.

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.

   The following observations and/or recommendations are made:

   - The program has a very successful 93% post-graduation job placement rate. With older solicitations requiring mandatory reporting for only two years post degree, it is currently difficult to evaluate the retention of SFS graduates in the workforce. However, new reporting requirements for SFS students, which began in Fall 2012, will allow the OPM SFS program office to track the retention of graduates, excluding those who work in the intelligence community, over a 10-year period.
   - Supervisors estimated between 79-82% of SFS graduates stay beyond their 2-year commitment, indicating that the overwhelming majority of SFS students remained past their obligation period.
   - Ensure that all stakeholders (i.e., Agencies, institutions, NSF, and OPM) continue collaborating as the needs of cybersecurity grow and change.
   - Maintain communication with the different stakeholder groups (i.e., agencies, institutions, NSF, and OPM) and continue to collect feedback on ways to improve the program and its implementation.

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

   The following observations and/or recommendations are made:

   - Continue the development of diversity metrics and strategies in order to increase the diversity of institutions, PIs, and participants so that the programs can address the Nation's needs in cybersecurity and a diverse workforce.
   - Implement the new proposal review template to ensure that the panel summaries contain adequate information for proposals that were not funded, so that the PIs can address shortcomings identified by the panel in future submissions.

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

   The following observations and/or recommendations are made:

   - Ensure outreach to Human Resources departments regarding program benefits, hiring authorities, and the SFS Job Fair.
   - Ensure all SFS scholarship recipients attain and maintain a basic clearance prior to entering the workforce.

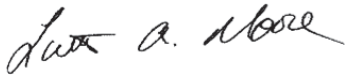
5. NSF would appreciate your comments on how to improve the COV review process, format and report template.

   The following observations and/or recommendations are made:

   - Provide materials ahead of time to allow for additional pre-COV preparation.

SIGNATURE BLOCK:

For the IGERT/GK-12/SFS COV:



12-24-14

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Loretta A. Moore
Sub-Chair, CyberCorps®: SFS Subcommittee

March 23, 2015

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Karen Klomparens
Chair, IGERT/GK-12/SFS COV