

**Report of the Committee of Visitors  
Division of Materials Sciences and Engineering  
Office of Basic Energy Sciences  
U.S. Department of Energy**

**to the**

**Basic Energy Sciences Advisory Committee**

**Review of Fiscal Years 2009, 2010, 2011**

**Germantown, Maryland**

**May 22-24, 2012**

**Chair - Professor Matthew Tirrell,  
University of Chicago**

**Accepted by BESAC July 27, 2012**

## Executive Summary

A Committee of Visitors (COV), under the guidance of the Basic Energy Sciences Advisory Committee (BESAC), reviewed the programs of the Materials Science and Engineering Division within the Department of Energy (DOE) Office of Basic Energy Sciences over the fiscal years 2009, 2010 and 2011. Thirty-three members of the committee met at the Germantown headquarters of BES on 22 May – 24 May 2012. The charge to the COV came from Professor John Hemminger, the chair of BESAC, and was: (i) For both DOE laboratory projects (Field Work Programs) and grant program, assess the efficacy and quality of the process used to solicit, review, recommend, and document proposal actions and to monitor active projects and programs. (ii) Within the boundaries defined by the DOE missions and available funding, comment on how the award process has affected the breadth and depth of portfolio elements, and the national and international standing of the portfolio elements. The COV was chaired by Professor Matthew Tirrell and the format of the review was similar to that used in the prior COVs. The COV Panels reviewed the 3 programmatic teams within the MSE Division plus the DOE Experimental Program to Stimulate Competitive Research program.

The COV commends all of the Division staff for their excellent work, which is carried out with admirable skill and dedicated professionalism. They are performing an important service to our universities, to the national laboratories, to the scientific community as whole, and to our nation. The work supported by this Division is of outstanding quality and meets a very high national and international standard.

The staff, program managers, and DMSE management are thanked for their help before and during this COV, and for the superb organization of the visit. This ensured that the whole COV process was conducted in an efficient and productive manner. All involved responded in a timely manner to the myriad of requests asked of them during the COV process.

The COV makes the following specific major recommendations:

- Given the untapped potential for additional, BES mission-relevant research, increased research funding to support rising costs and new ideas is strongly recommended.
- Increased travel funding for program managers is an imperative, in order for them to maintain contact with leading science and to promote our international competitiveness.
- Support for small/midscale instrumentation is a critical need.
- Maintain a good functional balance between the scales of scientific funding and funding of facilities; the advent of major facilities necessitates enhanced science funding in newly emerging areas.

- Continue to advance the implementation of PAMS aggressively.
- Compile and maintain an up-to-date database on gender and racial demographics of PIs and of postdocs and graduate students supported by the Division.
- Though time-to-decision statistics are improving, give further attention to this metric, particularly in contacting and documenting contact with applicants whose proposals are being declined for funding.
- Given the increased use of white papers, encouraged in the last COV report, track and record them in a more thorough manner, both to aid the COV review process and to document a higher level of proposal pressure than shows up statistically.
- Consider making more use of rebuttals in the proposal review process both to shape close decisions in either direction and to help calibrate reviewers.
- Provide future COV reviewers a more comprehensive perspective on review processes and oversight mechanisms for Laboratory programs to facilitate an evaluation comparable to that performed on single PI folders.

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## **1. Introduction**

This report documents the findings from a Committee of Visitors (COV) that was assembled under the auspices of the Basic Energy Sciences Advisory Committee (BESAC) to evaluate the processes and programs of the Division of Materials Sciences and Engineering (MSE) Division in the Office of Basic Energy Sciences (BES). The COV met at the Department of Energy facilities in Germantown, Maryland, for two and one-half days from May 22 - 24, 2012. This was the fourth in the series of COV reviews of the MSE Division; the first held in March 2003, with subsequent reviews in 2006 and 2009.

## **2. The Charge to the Committee of Visitors**

The charge to the COV was established in a letter from the Chair of BESAC, Professor John Hemminger, to Professor Matthew Tirrell, who had agreed to chair the COV. The letter is attached as Appendix I. The charge was to address the operations of the MSE Division during the fiscal years 2009, 2010, 2011. The components of the Division that the COV was asked to review were: The Materials Discovery, Design, and Synthesis Team (Materials Chemistry, Biomolecular Materials, Synthesis and Processing Science), the Scattering and Instrumentation Sciences Team (X-ray Scattering, Neutron Scattering, Electron and Scanning Probe Microscopy), The Condensed Matter and Materials Physics Team (Experimental Condensed Matter Physics, Theoretical Condensed Matter Physics, Mechanical Behavior and Radiation Effects, Physical Behavior of Materials), and the Experimental Program to Stimulate Competitive Research (EPSCoR).

The COV was asked to focus on the following major elements: (i) For both DOE laboratory projects (Field Work Programs, FWPs) and grants programs, assess the efficacy and quality of the process used to solicit, review, recommend, and document proposal actions and to monitor active projects and programs. (ii) Within the boundaries defined by the DOE missions and available funding, comment on how the award process has affected the breadth and depth of portfolio elements, and the national and international standing of the portfolio elements.

## **3. The Committee Membership**

The COV membership was selected by the COV chair, Professor Matthew Tirrell, in consultation with the chair of BESAC and the Division leadership. The members were chosen to represent a cross-section of experts in scientific fields relevant to the activities supported by the MSE Division. A balance was achieved between researchers who currently receive funding from BES and those that do not (22 and 10, respectively), between academic (24), national laboratory (4) and industrial researchers (3), between those who have previously served on a COV and those who have not (7 and 25, respectively), and also including representatives from EPSCoR states (5).

Given the size of the Division and the breadth of programmatic areas, a sizable committee was assembled. The original COV consisted of a total of 33 members, plus the chair, but due to a family illness, Professor Mustafa El-Sayed was unable to attend. The remaining 32 members were divided between 3 panels for the first reading of the grant/ FWP folders, and 4 panels for the second reading of the folders (which included the read for the EPSCoR program).

The following COV members served as the leaders for the Panels: Margaret Murnane (Scattering and Instrumentation Sciences), Juan de Pablo (Materials Discovery, Design and Synthesis), Max Lagally (Condensed Matter and Materials Physics), John Sarrao (EPSCoR)

A full listing of the COV members and their panel assignments for both the first and second reading of the folders is given in Appendix II and Appendix III, respectively.

## **4. The Review Process**

The COV assembled in Germantown at 8:55 AM on Tuesday, May 22, and adjourned at 11:00 AM on Thursday, May 24. The agenda for the COV is attached as Appendix IV.

Prior to convening in Germantown, each COV member was supplied with the link to the MSE Division COV website that included a comprehensive set of information pertaining to: the COV process, the report template, the core research activities of the Division, the procedures used by BES in reviewing both university and national laboratory applications, and a copy of the 2009 MSE Division COV report together with the response from BES. This comprehensive documentation was found to be useful in setting the stage for the actual COV and enabled the panel members to be prepared for the COV. Additional information was also supplied to each member during the meeting of COV. The binder included copies of the plenary presentations, a more detailed overview of each of the Division's programs, a summary of the EPSCoR program, and a copy of a DOE EPSCoR Study Group Recommendation.

The COV began with a reiteration of the charge from the BESAC chair, Professor John Hemminger. This was followed by an overview of BES by Dr. Harriet Kung, the Director of BES, an overview of the MSE Division by the Dr. Linda Horton, and a presentation on the new Portfolio Analysis and Management System (PAMS) system by Dr. Linda Blevins. The panel members were then presented with some details of the overall review process by the COV Chair, Professor Matthew Tirrell, before adjourning to their panel break-out rooms.

The first reading of the folders began with an overview of the Team programs by the MSE Division Team Lead and the respective program managers. Each panel was supplied with a set of proposal folders to evaluate the MSE Division award/decline/monitor process. These proposals were distributed among four types of programmatic decisions: easy awards, easy declines, difficult awards, and difficult declines, with 4 – 6 proposals in each program area, and thus a total about 30 proposals per panel. The projects included laboratory-based field work proposals (FWPs) and university grants.

The panels were free to request any additional materials (including folders for other projects) and information that they felt would help them in their evaluation process. The program managers were not present during the panel review process but were available to answer questions or provide additional input as needed.

The first reading of folders occupied the remainder of the first day, with the panels preparing preliminary conclusions that were discussed with the COV chair, and shared with the BES and Division management. Informal discussion and documentation continued well into the evening. The template used by the panels for their reports is presented in Appendix V.

On the morning of the second day, the panel members were assigned to different panels for the second read. The panel leads, however, remained with their original assignment to add continuity and context for the COV members assigned to do the second reading of the folders. The second reading allowed refinement and review of the preliminary findings. Also on the second day, a fourth panel was assembled, led by John Sarrao, Los Alamos National Laboratory, to conduct the first and only reading of the EPSCoR program folders.

During the afternoon of the second day, the original members of each panel reconvened (with the exception of the EPSCoR panel, which continued its deliberations) with the panel lead to merge and finalize the findings from the first and second reads, and to prepare materials for the final report. The entire COV then met in executive session to discuss and reach consensus on the major findings and recommendations.

On the morning of the third day the COV Chair and panel leads met and presented the major findings and recommendations to BES management, MSE Division management, and the MSE Division program managers.

The written reports from the panels (Appendix VI and Appendix VII) and the conclusions and recommendations drawn from the executive session provided the basis for this report.

## 5. Major Findings of the COV

1. The work supported by this Division is of outstanding quality and meets a very high national and international standard. Research supported has an excellent balance of superb scientific quality and investment in high-risk, high-reward research.
2. The Division staff and program managers work with demonstrable skill, dedication, professionalism and scientific judgment. The proposal review processes are rigorous and executed with care and consistency. Sufficient reviews were obtained in every case examined and the final decisions are generally thoroughly documented.
3. The program managers use the peer review system that is in place very effectively, with appropriate judgment and flexibility in reaching funding decisions.
4. The Division of Materials Science and Engineering plays a distinctive, and indeed uniquely important, role in the spectrum of agencies supporting materials research in the US. The ability and commitment of DMSE to support research programs over a substantial period of time is very important to maintaining the vibrancy and competitiveness of the field. At the same time, the portfolio of the Division is dynamic and able to launch new initiatives.
5. There is considerably more untapped research potential worthy of financial support in the materials science community, if more funding were available. As an example, but not limited to this example, increased support for small and mid-scale instrumentation would be beneficial.
6. There were no data provided on the gender or racial diversity of the PIs or postdocs and graduate students supported by the Division.
7. There is a disparity in the style of presentation of information provided to the COV process on the proposals for university grants and for laboratory programs with multiple FWPs, which leads to different degrees of attention to these categories of programs in the reviews.
8. The increased use of white papers, which is laudable, leads to several interesting observations and findings:
  - The appropriate discouragement of an unsuitable idea proffered in a white paper is a form of declination, not reflected in statistics. Therefore, statistics in use now may not accurately reflect the full proposal pressure on the Division.
  - Tracking white paper submissions, and keeping them in files where the white paper leads to a proposal submission, may provide a useful additional source of information on the content and trends of the Division's programs.
  - When white papers are submitted in response to an FOA for a new initiative, the volume of white papers is sometimes so large that the individual documents may not receive adequate attention.

## 6. Major Recommendations of the COV

- Given the untapped potential for additional, BES mission-relevant research, increased research funding to support rising costs and new ideas is strongly recommended.
- Increased travel funding for program managers is an imperative, in order for them to maintain contact with leading science and to promote our international competitiveness.
- Support for small/midscale instrumentation is a critical need.
- Maintain a good functional balance between the scales of scientific funding and funding of facilities; the advent of major facilities necessitates enhanced science funding in newly emerging areas.
- Continue to advance the implementation of PAMS aggressively.
- Compile and maintain an up-to-date database on gender and racial demographics of PIs and of postdocs and graduate students supported by the Division.
- Though time-to-decision statistics are improving, give further attention to this metric, particularly, in contacting and documenting contact with applicants whose proposals are being declined for funding.
- Given the increased use of white papers, encouraged in the last COV report, track and record them in a more thorough manner, both to aid the COV review process and to document a higher level of proposal pressure than shows up statistically.
- Consider making more use of rebuttals in the proposal review process both to shape close decisions in either direction and to help calibrate reviewers.
- Provide future COV reviewers a more comprehensive perspective on review processes and oversight mechanisms for Laboratory programs to facilitate an evaluation comparable to that performed on single PI folders.

### **Comment:**

This last recommendation stems from the different appearance to the COV of the documentation for laboratory reviews, several of which, owing to their size, were provided on DVDs rather than on paper. This point was discussed at the out-briefing and any misconceptions about the documentation of lab reviews was clarified there and in a follow-up email from DMSE Director Horton.

## Appendix I: Charge from the Chair of BESAC, Prof. John Hemminger to the Chair of the COV, Prof. Matthew Tirrell.

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SANTA BARBARA • SANTA CRUZ

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February 12, 2012

Professor Matthew Tirrell  
Pritzker Director  
Institute for Molecular Engineering  
University of Chicago  
Searle Chemistry Laboratory, Room 402  
5735 South Ellis Avenue  
Chicago, IL 60637

Dear Professor Tirrell:

The Basic Energy Sciences Advisory Committee (BESAC) has been charged by the Department of Energy Office of Science to assemble a Committee of Visitors (COV) to review the management processes for the Materials Sciences and Engineering Division of the Basic Energy Sciences (BES) program. Thank you for agreeing to chair this BESAC COV panel. Under your leadership, the panel should provide an assessment of the processes used to solicit, review, recommend, and document proposal actions and monitor active projects and programs.

The panel should assess the operations of the Division's programs during the fiscal years 2009, 2010, and 2011. The panel may examine any files from this period for both DOE laboratory projects and university projects. The components of the Division that you are being asked to review are:

- (1) Materials Discovery, Design and Synthesis
- (2) Condensed Matter and Materials Physics
- (3) Scattering and Instrumentation Sciences
- (4) Experimental Program to Stimulate Competitive Research

You will be provided with background material on these program elements prior to the meeting. The COV is scheduled to take place Tuesday, May 22 – Thursday, May 24, 2012 at the BES/DOE Germantown location at 19901 Germantown Road, Germantown, Maryland 20874-1290. A presentation to BESAC is requested at its July 26-27, 2012 meeting. Following acceptance of the report by the full BESAC committee, the COV report with findings and recommendations will be presented to the Director of the Office of Science.

I would like the panel to consider and provide evaluation of the following four major elements:

1. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:

- (a) solicit, review, recommend, and document proposal actions and
  - (b) monitor active projects and programs.
2. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
- (a) the breadth and depth of portfolio elements, and
  - (b) the national and international standing of the portfolio elements.

If you have any questions regarding BESAC or its legalities, please contact Katie Perine, Office of Basic Energy Sciences at 301-903-6529 or by e-mail at [katie.perine@science.doe.gov](mailto:katie.perine@science.doe.gov). Teresa Crockett, the Program Analyst for the Materials Sciences and Engineering Division, will provide logistical support for the COV meeting. She may be contacted by phone at 301-903-5804 or by e-mail at [teresa.crockett@science.doe.gov](mailto:teresa.crockett@science.doe.gov). For questions related to the Materials Sciences and Engineering Division, please contact Linda Horton, 301-903-7506, or by e-mail at [linda.horton@science.doe.gov](mailto:linda.horton@science.doe.gov). Also, if I can be of any help with the process, please feel free to contact me, 949-824-5796 or by email at [jchemmin@uci.edu](mailto:jchemmin@uci.edu).

Sincerely,



Digitally signed by John Hemminger  
DN: cn=John Hemminger,  
o=University of California, Irvine,  
ou=Office of Research,  
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John C. Hemminger, Chair  
Basic Energy Sciences Advisory Committee  
Vice Chancellor for Research, UC Irvine  
Professor of Chemistry

cc: T. Crockett  
L. Horton  
H. Kung  
K. Perine

## Appendix II: COV Members and Contact Information

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* COV Chair	**Panel Leads	***BESAC Chair	

## Appendix III: COV Panel Assignments

### First Read

<b>Panel 1</b>	<b>Scattering and Instrumentation Sciences</b>			
	Electron and Scanning Probe Microscopies, Neutron Scattering, X-Ray Scattering			
<b>Chair: Margaret Murnane</b>	<b>Panel Members</b>			
	Simon Bare	Collin Broholm	Tom Devereaux	Ernie Hall
	Chris Hammel	Alamgir Karim	John Sarrao	Oleg Shpyrko
	Susanne Stemmer			
<b>Panel 2</b>	<b>Materials Discovery, Design and Synthesis</b>			
	Synthesis and Processing, Materials Chemistry, Biomolecular Materials			
<b>Chair: Juan de Pablo</b>	<b>Panel Members</b>			
	Mike Aziz	Jeff Brinker	Bruce Chase	Vinayak Dravid
	Kim Dunbar	Arunava Gupta	Yves Idzerda	Monica Olvera de la Cruz
	Elsa Reichmanis			
<b>Panel 3</b>	<b>Condensed Matter and Materials Physics</b>			
	Mechanical Behavior and Radiation Effects, Physical Behavior, Experimental Condensed Matter Physics, Theory Condensed Matter Physics			
<b>Chair: Max Lagally</b>	<b>Panel Members</b>			
	Sam Bader	Jim Freericks	Giulia Galli	Rachel Goldman
	Robin Grimes	Philip Kim	Feng Liu	Bill Nix
	Simon Phillpot	John Xiao	Stefan Zollner	

### Second Read

<b>Panel 1A</b>	<b>Scattering and Instrumentation Sciences</b>			<b>EPSCoR Panel 4</b>
	Electron and Scanning Probe Microscopies, Neutron Scattering, X-Ray Scattering			
<b>Chair: Margaret Murnane</b>	<b>Panel Members</b>			
	Jeff Brinker	Sam Bader	Vinayak Dravid	
	Kim Dunbar	Jim Freericks	Philip Kim	
	Bill Nix			
<b>Panel 2A</b>	<b>Materials Discovery, Design and Synthesis</b>			
	Synthesis and Processing, Materials Chemistry, Biomolecular Materials			
<b>Chair: Juan de Pablo</b>	<b>Panel Members</b>			
	Tom Devereaux	Alamgir Karim	Rachel Goldman	
	Robin Grimes	Feng Liu	Simon Phillpot	
	Oleg Shpyrko			
<b>Panel 3A</b>	<b>Condensed Matter and Materials Physics</b>			
	Mechanical Behavior and Radiation Effects, Physical Behavior, Experimental Condensed Matter Physics, Theory Condensed Matter Physics			
<b>Chair: Max Lagally</b>	<b>Panel Members</b>			
	Mike Aziz	Collin Broholm	Ernie Hall	
	Monica Olvera de la Cruz	Elsa Reichmanis	Susanne Stemmer	

## Appendix IV: COV Agenda

**Agenda**  
**Committee of Visitors Review of the Materials Sciences and Engineering Division**  
**May 22 - 24, 2012, DOE Germantown Complex**

**Tuesday, May 22, 2012**

Time	Activity	Participants/Lead	Location
7:50am	Pick-up via bus	COV Members/Teresa Crockett	Front of Hotel
8:00am - 8:50am	Check-in Germantown Facility	COV Members/BES Staff	North Lobby
8:55 am - 9:15am	Welcome and Charge to the Committee	John Hemminger, BESAC Chair	A-410
9:15 am - 9:30am	Welcome and SC-BES Overview	Harriet Kung, BES Associate Director	A-410
9:30 am - 10:15am	MSE Overview & Statistics	Linda Horton, MSE Division Director	A-410
10:15 am - 10:35am	PAMS – Portfolio Analysis & Management System	Linda Blevins, Office of Science	A-410
10:35am - 11:00am	Instructions, procedures, and schedule	Matthew Tirrell, COV Chair	A-410
11:00am - 11:20am	Refreshment Break & Move to Panel Rooms		A-410
11:20am - 12:30pm	<b>Team Overviews:</b> • PM presentations (10 mins each plus discussions) • Q&A with MSE Rep • Preliminary Review of Folders		
	<b>Panel 1 – Scattering &amp; Instrumentation Sciences Team</b>	<b>Panel 1 - Margaret Murnane, Lead</b> MSE Rep: Helen Kerch MSE Staff: P. Thyagarajan, Lane Wilson, Jane Zhu Admin Support: Cheryl Howard	E-301
	<b>Panel 2 – Materials Discovery, Design, and Synthesis Team</b>	<b>Panel 2 – Juan de Pablo, Lead</b> MSE Rep: Arvind Kiri MSE Staff: Bonnie Gersten, Craig Henderson, Michael Markowitz, Michael Sernett Admin Support: Jorge Mariani	E-401
	<b>Panel 3 – Condensed Matter &amp; Materials Physics Team</b>	<b>Panel 3 - Max Lagally, Lead</b> MSE Rep: Jim Horwitz MSE Staff: Jim Davenport, Refik Kortan, Andy Schwartz, John Veltrano Admin Support: Marsophia Agnart	A-410
12:30pm - 4:30pm	<b>Same Breakout Panels and Meeting Locations as Listed Above</b>  <b>First Read: Review Folders and Formulate Panel Comments</b>  <b>***Lunch and afternoon refreshments will be available in Panel Rooms***</b>		
4:30pm - 4:45pm	Panel Members Check-out Germantown Facility / Return to Hotel	COV members/BES Staff	Germantown Front Entrance
4:30pm - 5:00pm	COV Executive Session	COV Panel Leads and Chair	G-426
5:00pm - 5:30pm	COV and BES General Discussion	COV Panel Leads & Chair and BES Management	G-426
5:30pm - 5:45pm	COV Chairs / Team Lead Check-out Germantown Facility	COV members/Teresa Crockett	North Lobby
6:00pm - 7:30pm	Dinner	MSE/COV members	Carrabba's

**Agenda**  
**Committee of Visitors Review of the Materials Sciences and Engineering Division**  
**May 22 - 24, 2012, DOE Germantown Complex**

**Wednesday, May 23, 2012**

Time	Activity	Participants/Lead	Location
7:50am	Pick-up via bus	COV Members/Teresa Crockett	Front of Hotel
8:00am - 8:30am	Check-in Germantown Facility	COV Members/BES Staff	North Lobby
8:30am - 11:30pm	<b>Panel 1A</b> – Scattering & Instrumentation Sciences Team	<b>Panel 1A</b> - Margaret Murnane, Lead MSE Rep: Helen Kerch MSE Staff: P. Thyagarajan, Lane Wilson, Jane Zhu Admin Support: Cheryl Howard	E-301
	<b>Panel 2A</b> – Materials Discovery, Design, and Synthesis Team	<b>Panel 2A</b> – Juan de Pablo, Lead MSE Rep: Arvind Kiri MSE Staff: Bonnie Gersten, Craig Henderson, Michael Markowitz, Michael Sennett Admin Support: Jorge Mariani	E-401
	<b>Panel 3A</b> – Condensed Matter & Materials Physics Team	<b>Panel 3A</b> - Max Legally, Lead MSE Rep: Jim Horvitz MSE Staff: Jim Davenport, Refik Kortan, Andy Schwartz, John Vetrano Admin Support: Marsophia Agnant	A-410
	<b>Panel 4</b> – EPSCoR	<b>Panel 4</b> - John Sarrao, Lead MSE Rep: Helen Kerch MSE Staff: Tim Fitzsimmons Admin Support: Cheryl Howard	G-207
	<b>Second Read:</b> •Review of Folders •Formulate Panel Comments •Review 1st Read Comments		
***Refreshments will be available in Panel Rooms***			
11:30am - 1:00pm	Working lunch served in Panel Rooms		
12:30pm - 1:30pm	COV Executive Session Preliminary Panel Findings	COV Panel Leads and Chair	F-441
1:30pm - 4:50pm	<b>Report Preparation and Panel Breakouts</b>	Panel 1 - Margaret Murnane (First day reviewers)	E-301
		Panel 2 - Juan de Pablo, Lead (First day reviewers)	E-401
		Panel 3 - Max Legally, Lead (First day reviewers)	A-410
		Panel 4 - John Sarrao, Lead	G-207
		<b>Report Preparation:</b> • Merge 1st and 2nd Read Comments • Formulate Panel Final Comments • Outline Summary for Briefing • Prepare Draft Panel Report	
4:50pm - 5:00pm	Check-out Germantown Facility	COV members/Teresa Crockett, Admin Staff	North Lobby
5:00pm	Return to Hotel	COV Members/BES Staff	Germantown Front Entrance
6:00pm - 7:30pm	Dinner	MSE/COV members	On your own

**Thursday, May 24, 2012**

Time	Activity	Participants/Lead	Location
7:50am	Pick-up by Team Leads	COV Chair & Panel Leads/Team Leads	Front of Hotel
8:00am - 8:30am	Check-in Germantown Facility	COV Chair & Panel Leads/BES Staff	North Lobby
8:30am - 9:15am	Breakout Panels - Final Wrap-Up	COV Chair & Panel Leads	A-410
9:15am - 10:00am	COV Executive Session	COV Chair & Panel Leads / BES Management	A-410
10:00am - 11:00am	Closeout Session	COV Chair & Panel Leads / BES Staff	A-410
11:00am	Adjourn - Thank You!		

## Appendix V: First Read/Second Read COV Report Template and Progress Toward the Long-term Goals of the Office of BES

### REPORT TEMPLATE

BES COMMITTEE OF VISITORS (COV) Reviewing the  
Materials Sciences and Engineering Division Fiscal Years  
2009, 2010, and 2011

#### First or Second Read Subpanel

Program: \_\_\_\_\_

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:

- (a) solicit, review, recommend, and document proposal actions and
- (b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:

- (a) the breadth and depth of portfolio elements, and
- (b) the national and international standing of the portfolio elements.

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#### **I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES**

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs processes and management used to:

##### **(a) Solicit, review, recommend, and document proposal actions**

Consider, for example:

- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

Findings:

Comments:

Recommendations:

**(b) Monitor active project and programs**

Consider, for example

- written progress reports
- contractors meetings
- site visits
- interactions at topical, national and other meetings;

Findings:

Comments:

Recommendations:

**II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS**

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

**(a) the breadth and depth of portfolio elements**

Consider, for example:

- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division
- the appropriateness of award scope, size, and duration

Findings:

Comments:

Recommendations:

**(b) the national and international standing of the portfolio elements**

Consider, for example:

- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

Findings:

Comments:

Recommendations:

## Appendix VI: Summary Reports from the Four Panels

- Panel 1. Scattering and Instrumentation Sciences Team  
Panel 2. Materials Discovery, Design, and Synthesis Team  
Panel 3. Condensed Matter and Materials Physics Team  
Panel 4. EPSCoR

### Panel 1. Scattering and Instrumentation Sciences Team

BES COMMITTEE OF VISITORS (COV) Reviewing the  
Materials Sciences and Engineering Division Fiscal Years  
2009, 2010, and 2011

Charge to the COV:

- I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
- (a) solicit, review, recommend, and document proposal actions and
  - (b) monitor active projects and programs.
- II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
- (a) the breadth and depth of portfolio elements, and
  - (b) the national and international standing of the portfolio elements.
- III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long-term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

---

#### **I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES**

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs processes and management used to:

**(a) Solicit, review, recommend, and document proposal actions**

Consider, for example:

- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

**Findings:**

- The Scattering and Instrumentation Science (SIS) program within the Division of Materials Sciences and Engineering is doing an excellent job in securing high-quality proposals (sometimes through a white paper process), administering in-depth and careful reviews, avoiding conflicts and making very effective funding decisions.
- Successful proposals align well with the guidelines of BES. The importance of Discovery Science and relevance to mission of DOE is known and understood by PIs in general.
- An adequate number (3-5) of in-depth reviews from reviewers with diverse expertise is obtained for all proposals, and international reviewers are also used. DOE can be commended for securing reviews from leading scientists who can assess high-risk, high-payoff research and who are well respected in their communities.
- The PMs are proactive in notifying the PIs about the outcome of the proposal as soon as possible. Renewal proposals are processed within 150 days on average, while new proposals can take a longer time to evaluate – 230 days on average.
- The vast majority of the proposals examined reported results from prior support in a clear manner. Only one renewal proposal did not seem to include results from prior support in a separate section of the proposal, or include a separate list of publications from the previous funding period. This omission makes it more time consuming to assess past productivity.
- Letters of support are sometimes included in proposals.
- PIs are given a chance to respond to reviewer comments in some cases.

**Recommendations:**

- DOE might consider keeping track of the number of white papers submitted to programs, in response to solicitations or internally at DOE laboratories. These numbers might more accurately reflect the very high demand and need for DOE support.
- Since letters of support are sometimes included in proposals, perhaps DOE can provide guidelines as to when these are appropriate and when they add value in the review process? Guidelines could be posted on the web page so that all PIs are informed.
- The PMs manage conflict-of-interest issues well. To further help in this area, perhaps PIs could be allowed to list direct competitors (or even a few suggested

reviewers). Guidelines could be posted on the web page so that all PIs are informed.

- The COV feels that the use of a rebuttal process benefits the review and selection process. DOE could consider whether to make this rebuttal process more uniformly available to PIs. This might have the added benefit in improving the quality of the reviews and reducing any potential bias if reviewers are made aware that the PI would have this option.
- DOE should continue the successful efforts to reduce proposal processing times, with the goal of reaching and communicating a decision within 180 days for all proposals on average. PAMS should help with this effort.
- DOE might consider keeping track of the number of white papers submitted to programs, in response to solicitations or internally at DOE laboratories. These numbers might more accurately reflect the very high demand and need for DOE support.

**(b) Monitor active project and programs**

Consider, for example

- written progress reports
- principal investigators' meetings
- site visits
- effective interactions between program managers and PIs

**Findings:**

- The PMs have multiple effective mechanisms for monitoring projects and programs. These include annual progress reports, PI meetings, site visits when appropriate, workshops and conferences. The PI meetings can also be useful for fostering new collaborations between different PIs and are an excellent mechanism for the PM to review the whole portfolio in expedient manner.
- The use of selected highlights is important for communicating the value and excitement of DOE research to the broader community.

**Recommendations:**

- To stay well informed about the national & international landscape of research, there should be adequate funding to allow the PM to visit PI home institutions and also to attend appropriate national and international conferences. This should be given a very high priority.

## **II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS**

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

### **(a) The breadth and depth of portfolio elements**

Consider, for example:

- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division and BES
- the relevance of the portfolio with respect to the missions of the program, division, BES, and DOE
- the appropriateness of award scope, size, and duration

### **Findings:**

- The Scattering and Instrumentation Science (SIS) program should be commended for the excellent quality and scope of science supported by all three areas (X-ray Scattering/ Neutron Scattering/ Electron and Scanning Probe Microscopies). The PIs and science projects are of the highest caliber. DOE should be commended for supporting projects that are of a high-risk, potentially transformative, nature.
- Research supported by Scattering and Instrumentation Sciences is critical for the DOE mission of energy innovation and for the BES goal of discovery science. New tools and techniques that emerge as a result of SIS support have an enormous impact on scientific, technological and industrial innovation.
- There is a satisfactory turnover of PIs and new PIs are added through the regular grant programs and through Early Career Awards.
- Support for cutting-edge techniques and science that will use exciting new large and small-scale x-ray and neutron sources has lagged behind the major investments in facilities infrastructure. This has future implications for community development, student training, harnessing the scientific opportunities now present and for international competitiveness.

## **Recommendations:**

- Funding for discovery science and innovation needs to grow proportionately with major investments in new scientific capabilities and facilities. A vibrant landscape of innovative new science requires multiple approaches from multiple groups at national labs and universities, to maintain a healthy scientific process, where results are checked by others, and to compete well internationally.
- The DOE should consider investing in the development and construction of small and mid-scale x-ray and electron/scanning probe instruments and tools at universities and national laboratories in order to enhance and accelerate discovery and innovation.
- BES should continue to take into account the increasing cost of research due to rapidly increasing tuition and indirect costs at universities. The key innovators that pioneer advances in critical fields need to be supported adequately to harness the best science and to impact the economy and society in the long term.
- It would be worthwhile to avail of the new PAMS system to develop data on the spectrum of PIs, scientists and students supported in terms of diversity. Some of the best graduates are now female and minority, and data are needed to assess that the funding process is working well for all PIs.

## **(b) The national and international standing of the portfolio elements**

Consider, for example:

- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

## **Findings:**

- The COV commends SIS for crafting three programs that are internationally competitive. The PIs and projects are of the highest caliber and most of the science is high-risk and potentially transformative in nature. Research supported by SIS has propelled the US into a leadership position thus far in x-ray, neutron and electron scattering. The advanced tools and techniques that have emerged accelerate the development of new materials technologies.
- Most of the PIs supported are international leaders, while bright young scientists are also supported.

## **Recommendations:**

- As the COV noted above, to stay adequately informed about the national & international landscape of competitive research, there should be adequate funding to allow the PM to visit PI home institutions and also to attend appropriate national and international conferences. This should be given a very high priority.

## **Panel 2. Materials Discovery, Design, and Synthesis Team**

BES COMMITTEE OF VISITORS (COV) Reviewing the  
Materials Sciences and Engineering Division Fiscal Years  
2009, 2010, and 2011

Charge to the COV:

I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:

- (a) solicit, review, recommend, and document proposal actions and
- (b) monitor active projects and programs.

II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:

- (a) the breadth and depth of portfolio elements, and
- (b) the national and international standing of the portfolio elements.

III. Assess the program's contribution to progress in achieving the Office Basic Energy Science long-term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

---

### **I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES**

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs processes and management used to:

#### **(a) Solicit, review, recommend, and document proposal actions**

Consider, for example:

- consistency with priorities and criteria stated in the program's solicitations, announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

**Findings:**

- Many decisions to invite proposals are made on the basis of white papers. In some cases white papers are commented on and sent back to PI for improvements, and result in full proposals being submitted. At present, the white paper trail (for unsolicited proposals) is not part of the record. These practices impair the panel's ability to evaluate the strategic direction of the portfolio, as whatever guidance is given to the PIs is not available for review.
- For specific initiatives that require a white paper or pre-proposal, the panel would like to have the opportunity to evaluate those white papers and the process that was followed to reach particular outcomes.
- The panel finds that the opportunity to submit rebuttals of critiques provide the program managers with additional information to reach appropriate funding decisions, particularly in decisions to support difficult cases. The process offers the flexibility to support a high-risk research portfolio with the right balance of near-term and long-term vision. Funding decisions are well thought out.
- It was found that the time to reach funding decisions could be shortened, particularly for rejections.
- The breadth and quality of reviews was found to be excellent. Many proposals were examined by international experts, thereby bringing additional, high-quality perspectives into the decision making process. This is an indicator of the high quality of the program and the science that is being supported.
- Funding decisions are very well documented. The panel commends the program managers for the care with which the dossiers are put together.

**Comments:**

- Initiatives to bring in new PIs into the program, such as the Early Career mechanism, were viewed favorably by the panel.
- The panel found isolated cases of PIs that were discouraged from submitting a renewal proposal. That process should be better documented.

**Recommendations:**

- Program managers are encouraged to play a more active role in disseminating their programs and opportunities within them. Outreach for new initiatives should be vigorous.

- To the extent possible, the white paper process should be documented, particularly for initiatives that require that white papers be submitted. This will improve the panel's ability to understand proposal pressure and the strategic directions adopted by the division.
- The panel recommends that the program provide statistics on the program demographics, including gender, diversity, and geographic distribution.

**(b) Monitor active project and programs**

Consider, for example

- written progress reports
- principal investigators' meetings
- site visits
- effective interactions between program managers and PIs

**Findings:**

- The progress reports are appropriate and informative.
- Principal investigator meetings were viewed extremely favorably by the panel. Such meetings are of a very high quality and provide an effective forum to develop collaborations and new research directions amongst PIs.
- Program managers cannot attend a sufficient number of meetings to interact with their own PIs.
- FWP's do not appear to submit annual progress reports. It would be helpful to have such reports.

**Recommendations:**

- Provide program managers with sufficient resources to participate in national meetings or workshops where DOE-funded PIs present their work. Such meetings are necessary to maintain a suitable perspective of the quality of their PIs vis-à-vis the scientific community and the program's directions.

## **II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS**

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

### **(a) The breadth and depth of portfolio elements**

Consider, for example:

- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division and BES
- the relevance of the portfolio with respect to the missions of the program, division, BES, and DOE
- the appropriateness of award scope, size, and duration

### **Findings:**

- The quality of the science and the investigators was found to be excellent.
- The range of funding is broad, and program managers have the flexibility to fund different projects at an appropriate level.
- The panel found a good balance between renewal of successful programs, and termination of purely incremental programs. Even successful programs undergo considerable scrutiny before renewal decisions are made.
- The panel found that a healthy fraction of high-risk / high-payoff proposals is supported by the program.
- The research supported by the program is highly relevant to DOE's mission. The program is unique in that it provides support for basic science within a mission-oriented context.
- Combined theory-experiment proposals were viewed favorably by the panel; in this respect, this DOE program is uniquely positioned to benefit from the Materials Genome Initiative.
- The panel found evidence of many multi-PI, multi-institution projects. This was viewed favorably by the panel.

- The panel found a good balance among high-risk/high-payoff projects, and programs focusing on core areas of research. The research was in all cases innovative and, in many cases, interdisciplinary.
- Considerable evidence was presented of basic research leading to technology innovation in the field of energy.

**Recommendations:**

- The panel recommends that program managers be given the option of making awards for longer periods of time (for example 4 years), to be consistent with the cycle of graduate-student research. Longer awards should not come at the expense of funding amount.
- The panel recommends that the program continue funding joint experimental-theoretical proposals or synthetic-characterization proposals. Such projects are particularly effective, and will contribute to the program's ability to benefit uniquely from new initiatives such as the Materials Genome.

**(b) The national and international standing of the portfolio elements**

Consider, for example:

- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

**Findings:**

- The program is truly world-class and its PIs have international stature. The programs are unique in the scope and the originality of the research they support. The biomolecular materials program, for example, is unique in the nation and the world in its views towards adopting ideas or principles from biological systems to create materials of relevance to energy research with hitherto unavailable functionalities.
- Many discoveries sponsored by the program have been groundbreaking.
- The panel found numerous instances on the use of "Journal Cover" art to justify the impact of a research program. This is not an appropriate metric, and some in the panel viewed this as a waste of resources.

**Comments:**

- It is unclear whether DOE has mechanisms to support international collaborations. Such collaborations would be beneficial to DOE's mission.

- The panel was asked to evaluate quality – the issue of appropriate metrics continues to be a challenge. The panel agrees that peer review of proposals is the best metric.

**Recommendations:**

- Do not rely on “Cover Art” to assess quality; other metrics are more appropriate.
- In order to assess the quality of their programs within a world context, PMs must be able to attend international meetings or workshops and visit other institutions.

**Panel 3. Condensed Matter and Materials Physics Team**

BES COMMITTEE OF VISITORS (COV) Reviewing the  
Materials Sciences and Engineering Division Fiscal Years  
2006, 2007, and 2008

Charge to the COV:

- I. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:
  - (a) solicit, review, recommend, and document proposal actions and
  - (b) monitor active projects and programs.
  
- II. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected:
  - (a) the breadth and depth of portfolio elements, and
  - (b) the national and international standing of the portfolio elements.
  
- III. Assess the program’s contribution to progress in achieving the Office Basic Energy Science long term goals (shown in III, below) that are being tracked by the Office of Management and Budget (OMB).

**I. EFFICACY AND QUALITY OF THE PROGRAM’S PROCESSES**

Based on the COV’s study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs processes and management used to:

**(a) Solicit, review, recommend, and document proposal actions**

Consider, for example:

- consistency with priorities and criteria stated in the program’s solicitations, announcements, and guidelines

- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

### **Findings:**

- PMs in CMMP are effectively using a combination of peer review and programmatic judgment, with a very high quality of reviewers (including early-career) and reviews, and a detailed evaluation by PMs of the reviewer comments in each file. Reviews are requested and reminders sent in a timely manner. Documenting of decision in the file is highly professional, thorough, and complete. PMs effectively and appropriately use rebuttal process to assist in funding decisions, although they are not always well documented.
- To obtain the best proposals in existing and programmatically desirable new areas, and to explain BES program interests and priorities, PMs attend major meetings and workshops. The use of white papers is increasingly an approach used by CMMP for new proposals or solicitations. The Young Investigator Program is effectively used to add new talent into the CMMP programs.
- The time for making fund/no fund decisions fell by ~40 days. Yet the time between decline decision and official notification is in many cases quite long.

### **Comments:**

- We embrace the idea that the PMs have latitude in decision making. We believe this is a key strength that must be maintained to build a dynamic portfolio.
- PMs are to be complimented that they have embraced the increased use of white papers recommended by the last COV, to the advantage of the program and the research community.
- It is not documented how progress reports are used by PM to assess progress on a project.

### **Recommendations:**

- To maintain dynamic programs, more travel funds should be provided to make it possible for PMs to attend multiple meetings per year. The use of webinars should be considered to inform and update the community on programs and evolving directions. Descriptions of currently funded projects should be made easier to find on the web site.

#### **(a) Monitor active project and programs**

Consider, for example

- principal investigators' meetings
- site visits
- effective interactions between program managers and PIs

### **Findings:**

- Contractor meetings are seen to be a very effective means of monitoring programs, providing calibration to the PM of the relative quality or weakness of individual projects in a program, as well as a way to seek renewal and new directions.
- Annual reports, for projects in second and later years of their existence, appear thorough and are found in the individual project files.

### **Comments:**

- For the large, diverse programs, a comprehensive, program-wide contractor meeting may be cumbersome, with loss of effectiveness.
- The annual-report system is very useful in providing updates to the PM on the project. Anecdotally, their preparation is also a quite useful exercise for the researcher in calibrating progress on and direction of the project.
- Interactions between PMs and PIs of ongoing projects are hard to judge, as they are not documented in files. Anecdotally they appear to be relatively frequent.

### **Recommendations:**

- Consider documenting in the file any use of progress reports in assessing project progress.
- Consider making contractor meetings for the largest programs thematic, while maintaining synergy between theory and experiment. Clearly that requires more travel funds for PMs, as well as more time.

## **II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS**

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

### **(a) The breadth and depth of portfolio elements**

Consider, for example:

- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research

science thrusts

- the relationship of the portfolio to other parts of the Division and BES
- the relevance of the portfolio with respect to the missions of the program, division, BES, and DOE
- the appropriateness of award scope, size, and duration

### **Findings:**

- Workshops and contractor meetings are good avenues for PMs to learn about new ideas introduce new talent and create collaborations. PMs appear to fill gaps in funding and in program breadth by collaborating across program and division boundaries. The YIP fills an important need in obtaining breadth and new portfolio elements.
- Little information on diversity was provided to the COV.

### **Comments:**

- PMs are to be praised for efforts to create synergies and for championing new research directions and revitalization of programs. That is particularly noteworthy in Mechanical Properties, Theory, and Physical Properties.

### **Recommendations:**

- Expand town hall meetings, brown bag lunches, etc. at professional-society meetings to inform the relevant research community and to attract new ideas.
- Increased funds for PM travel should be provided.
- Provide evidence of efforts to increase diversity.

### **(b) The national and international standing of the portfolio elements**

Consider, for example:

- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

### **Findings:**

- The CMMP portfolio has an outstanding international reputation, with a distinguished pool of PIs, whose overall stature is extremely high. CMMP is overall optimally using peer review, while managing to keep programmatic control.
- No information on international programs, coordination, or collaboration was provided to the Panel.

### **Comments:**

- The Program Managers do an excellent job given financial constraints. There is considerable worry within the COV about increasing international competition in materials science and engineering research. The current level of investment by DOE (by extension the federal government) is significantly below what is necessary to continue to keep us competitive in research in the areas of interest to CMMP.

### **Recommendations:**

- BES management should provide evidence of international collaborations and international programmatic activity in overview talks for the COV.

### **Comments**

- The emphasis in DMSE on cover art and publishing in a small number of popular venues as a metric of quality are not viewed as true measures of quality by this Panel.

## **Panel 4. EPSCoR Report**

BES COMMITTEE OF VISITORS (COV) Reviewing the  
Materials Sciences and Engineering Division Fiscal Years  
2009, 2010, and 2011

Charge to the COV:

1. For both the Implementation grants and individual investigator projects through Laboratory-Partnership grants, assess the efficacy and quality of the processes used to:
  - (a) solicit, review, recommend, and document proposal actions and
  - (b) monitor active projects and program.
2. Within the boundaries defined by DOE missions and available funding, comment on:
  - (a) how the award process has addressed the EPSCoR program goals and
  - (b) how the Laboratory-Partnership program has taken advantage of the unique DOE laboratory assets.

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### **I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES**

Based on the COV's study of proposal actions completed within the past three fiscal years, please provide brief findings, recommendations, and comments on the following aspects of the programs processes and management used to:

**(a) Solicit, review, recommend, and document proposal actions**

Consider, for example:

Page 34 - consistency with priorities and criteria stated in the program's solicitations,

- announcements, and guidelines
- adequate number of reviewers for balanced review; use of reviewers having appropriate expertise/qualifications; use of a sufficiently broad pool of reviewers; avoidance of conflicts of interest
- efficiency/time to decision
- completeness of documentation making recommendations

### **Findings:**

- The overall quality of the management of the EPSCOR program continues to improve. Significant further strides have been made since the last COV, including responding to prior COV comments.
- Especially given the annual uncertainty of EPSCOR funding, the timeliness of reviews and decisions within the EPSCOR portfolio is impressive.
- The program manager is effectively including EPSCOR criteria in his decision making process, especially among proposals that are relatively comparable based on peer review input.
- In some cases the threshold between ‘fund’ and ‘not fund’ decisions is driven more by budgetary constraints than by differentiation in technical comments and numerical scores. While we believe that the PM has consistently made good decisions, care should be exercised in discounting statistically anomalous reviewers and over-emphasizing numerical scores in this situation.

### **Comments:**

- The program manager should develop uniform criteria for excluding reviewers based on institutional conflict of interest and implement them at the start rather than the end of the peer review process.
- The compressed schedule for reviews, driven principally by the EPSCOR funding cycle, may lead to less diverse (more lab-centric) reviewer pools and less than completely thorough reviews.
- Other forms of multi-institution partnerships, beyond laboratory partnerships, might be considered. The creation of seed funding opportunities might foster the initial nucleation and formation of teams.
- Explore how to use white papers in fostering ideas within the EPSCOR process without overburdening the PM or interfering with state-driven down-select processes.

### **Recommendations:**

- Develop a uniform approach to the use of rebuttals for referee reports, especially for cases that fall in the ‘difficult decline’ category. This is particularly relevant

to EPSCOR because of the use of numerical scores and the associated risk of artificial cut-offs.

- Raise expectations for laboratory-institution partnerships, including documented evidence of strong partnerships, in submitted proposals. Increasing the focus on user facility utilization could be an opportunity in this regard.

**(a) Monitor active project and programs**

Consider, for example

- written progress reports
- principal investigators' meetings
- site visits
- effective interactions between program managers and PIs

**Findings:**

- The increased use of site visits, especially for implementation grants, is positive. Further efforts to document agendas/lessons learned/best practices for these interactions would be valuable.
- The engagement of EPSCOR PIs in core program PI meetings, where applicable, is a positive means of fostering community engagement.
- Given the stated goal of EPSCOR to foster broader opportunities, the overall renewal rate should be lower than in the DMSE core program and the current limitation of only one renewal for each implementation grant is a positive. Similarly, EPSCOR should promote turn over in PIs and strive to avoid repeat performers.

**Comments:**

- BES program management should continue to engage in the broader dialogue associated with EPSCOR programs and e.g., state-federal interface considerations.

**Recommendations:**

- Develop quantitative metrics based on longitudinal PI funding (from DOE and other research agencies) to assess success of DOE EPSCOR program. Explore other metrics to track EPSCOR progress.

**II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS**

Taking into account the DOE, BES, and Division missions, the available funding, and information presented about the portfolio of funded science, comment on how the award process has affected:

**(a) The breadth and depth of portfolio elements**

Consider, for example:

- the overall quality of the science
- the balance of projects with respect to innovation, risk, and interdisciplinary research
- the evolution of the portfolio with respect to new investigators and new science thrusts
- the relationship of the portfolio to other parts of the Division and BES
- the relevance of the portfolio with respect to the missions of the program, division, BES, and DOE
- the appropriateness of award scope, size, and duration

**Findings:**

- There appears to be less risk in this portfolio than in the broader BES-DMSE portfolio. Given the desire to foster new/non-traditional performers through EPSCOR, this seems appropriate.

**Comments:**

- The question of portability of EPSCOR designated EC awards should be evaluated.
- The restriction to one active implementation grant per state was a good idea that fostered geographic diversity. The recent elimination of this requirement should be re-evaluated if possible.

**Recommendations:**

- The inclusion of Early Career awards in the EPSCOR portfolio was a good idea. This effort should be continued/expanded. The program should strive for geographical diversity in EC awards among the eligible states.
- The requirement of co-funding between EPSCOR and another DOE program is a positive. For similar motivations (fostering a sense of ownership), an appropriate level of cost sharing with home institutions should be restored, sufficient to promote engagement but not so high as to be exclusionary.

**(b) The national and international standing of the portfolio elements**

Consider, for example:

- the uniqueness, significance, and scientific impact of the portfolio
- the stature of the portfolio principal investigators in their fields
- the leadership position of the portfolio in the nation and the world

**Findings:**

- The evolution/migration of EPSCOR PIs to ‘regular’ research portfolios (both DOE and other agency funding) is positive and reflects on the stature of the portfolio.
- EPSCOR should develop, document, and track quantitative metrics for success. The recent and significant progress in maturing EPSCOR program management makes this possible. The advent of PAMS will be particularly valuable in this area.

**Recommendations:**

- Future COVs should consider EPSCOR-specific charge questions (as was done in the 2009 COV) to maximize the applicability/relevance of the advice provided.