Report
to the
Basic Energy Sciences Advisory Committee

Committee of Visitors
For
Basic Energy Sciences Scientific User Facilities Division

April 24 - 26, 2013
Germantown MD

I. Introduction and Overall Conclusions

More than the ten year ago a Committee of Visitors (COV) process was established for all divisions within the DOE Office of Science. Within the Office of Basic Energy Sciences, BESAC appoints the COV, provides the charge, and receives the report every three years. The 2013 COV for the Scientific User Facilities Division (SUFD) met in Germantown on April 24 - 26, 2013 to assess the three-year period 2010-2012. Membership of the COV is listed in Appendix A. The agenda is included as Appendix B.

The charge to the 2013 COV was as follows:
1. For SUFD and Accelerator and Detector program, assess the efficacy and quality of the processes used to: a) Solicit, review, recommend and document proposal actions
b) Monitor and review active projects, proposals, and facilities

2. Within boundaries defined by DOE missions and available funding, comment on how the award process has affected: a) Breadth and depth of portfolio elements and
b) The national and international standing of the portfolio elements

This report is organized as follows:
Section II contains findings and recommendations that are related to the entire portfolio of the Division. Section III presents the individual reports of the six teams that examined the major components of the portfolio

- Synchrotron Light Sources including the Accelerator & Detector Research Program
- Neutron sources
- Nanoscale Science Research Centers & Electron Beam Micro-Characterization Centers
- Construction Projects & MIEs

The overarching conclusions of the Committee are:

- **SUFD is commended for effective use of its available funding for constructing and operating a set of facilities that deliver world-leading science**
- **The efficacy of the processes to review, recommend and document proposal actions are excellent.**
- **The efficacy of the processes to monitor and review active projects, programs and facilities are also excellent**
- **SUFD staff are to be commended for rigorous and effective program management in a highly constrained budget environment**
- **Within the scope of DOE missions and available funding, the award processes continue to enhance the breadth and depth of portfolio elements as well as their national and international standing**
- **International competition in scientific user facilities is stiff; maintaining U.S. scientific leadership requires increased investments for the facilities and for user support**

II. SUFD-Wide Findings and Recommendations

A. Implementation of previous COV recommendations

SUFD actions have effectively addressed the majority of the recommendations made in the previous COV report. A few carry over items are discussed in the body of the report. In particular, the step to providing all data on computers to each reviewer is highly responsive and a great improvement of the COV process.

FINDINGS

• The travel budget for the Division is continues to be incommensurate with most effective oversight of the SUFD program. The budget precludes regular visits by the SUFD Program Managers to visit the facilities to assess comparable institutions abroad.

RECOMMENDATIONS

- **Enhance the effectiveness of program oversight by increasing the flexibility of SUFD managers interact with facility managers to communicate with the facilities staff including via increased on-site presence.**

B. Assessment of COV process effectiveness

FINDINGS:

• Complete sets of electronic files were made available to each COV member on individual computers. This was a large undertaking and is greatly appreciated.
• The electronic documentation was thorough and well organized.
• Staff was fully available and cooperative in answering questions. The pre-meeting with the COV chair was effective in enhancing the efficiency of the COV process.
• At the first breakout session of the COV subpanels, the cognizant SUFD program manager provided a brief but effective overview by for the facility type being assessed.
• Access to the Germantown Headquarters venue was improved by providing bus transport for the entire committee. Delays due to the need for security screening, were minimized by the advanced preparations made by the SUFD staff.

RECOMMENDATIONS:

• The move toward the PAMS database for review of proposals and awards is commendable and should be available to the next COV.

C. Facility review process description and effectiveness.

FINDINGS:

• The 3-year reviews of the facilities are well organized and well executed.
• A uniform definition of publications and high impact publications has been established for light sources and neutron sources.
• The facility review teams are carefully selected for subject matter competence and absence of conflict of interest.

• Responding to previous COV recommendations, SUFD is regularly including industry representatives among the types of organizations from which reviewers are drawn.
• Facility response to the recommendations based on the reviews and SUFD guidance is uneven in timing and completeness.
• Instructions to reviewers include assignments that are not communicated to the facilities prior to the review.
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RECOMMENDATION:
• Finalize the set of uniform definitions for nanoscience centers. Include citations and patents among the nanoscience center metrics.

D. General Issues
FINDINGS:
•The quality of the scientists at the facilities is the critical asset that ensures excellence and success.
• Different types of facilities serve different scientific communities. They are all needed and important.

RECOMMENDATIONS:
• Place added emphasis career development as well as on maintaining state-of-the-art experimental apparatus, sample environments and software at all facilities to maximize scientific productivity
• Additional new metrics that account for scientific impact should apply to all the types of scientific user facilities

III. Reports on the components of the portfolio

1. Synchrotron Light Sources

A. For the scientific user facilities including the accelerator and detector program, assess the efficacy and quality of the processes used to: (a) solicit, review, recommend and document proposal actions (b) monitor active projects, programs and facilities

Comments:

The subpanel reviewed DOE light source review over the last three years, which included 2010 reviews of the NSLS, APS, and SSRL 2011 reviews of the LCLS and ALS, and a 2012 review of the operating budget for the NSLS-II. In this COV the subpanels for the Light Sources and Detectors & Accelerators were combined. This worked well, but may require subdividing again as the ADR grows into ADOR.

In our assessment the SUFD efficacy and quality to review the light sources are rated as excellent. We are impressed by the level of thought and the work devoted by SUFD

managers to craft the requests for documentation that facilities must provide, select the reviewers, carry out the review, and provide feedback to the facility directors. The process ensures that all facilities are held accountable for producing the best science from their facilities and for spending the operating funds in a responsible manner. We commend SUFD for their rigor in their review of the facilities.

Typically, SUFD management informs the director of a light source about four months in advance of the date of their review. SUFD sends a detailed list of required documentation that must be available to the reviewers before the review. The reviewers are selecte carefully by SUFD, as evidenced by the reviewers comments which are extremely informative and detailed and which provide expert recommendation and guidance on how to proceed to maintain/increase successful performance of the facility. The reviewers are mostly scientists from National Laboratories but also from universities, industry and occasionally from overseas. The written feedback sent to light sources by SUFD is timely (about 4 months after the review) and the light source directors respond within 2 months to the points raised by SUFD based on the review.

Findings:

The committee was favorably impressed with the consistency of the documentation, with the comprehensive information requested and supplied by the sources during the review process and by the quality of the reviews. Record keeping was excellent.

Our specific findings are:

- The review process is comprehensive, balanced, fair, and transparent to all facilities since *all facilities* are reviewed using the same major criteria.
- Reviews provided important comments and where appropriate specific actionable recommendations for the light sources.
- The reviews were uniformly forthright, detailed, and contained a summary section at the beginning of the review. The detail of review comments indicated a deep appreciation of important issues that went beyond the documentation solicited. This depth indicates the importance of the on-site review.
- Review follow up was not documented between reviews.
- It is curious that “applications to energy” is not included in the overall request for information from the facilities.
- The travel budget for program managers is totally inadequate for their optimal monitoring of major, multi-program user facilities.
- The number and breadth of the reviewers for each facility was appropriate.
- The letters to all the reviewers for a given facility were identical although the prior COV recommended that reviewers with special expertise were asked to focus on their area of expertise
- The General User proposal review process differs widely for the different facilities

- The recommendations from the prior facility reviews were not sent to the facility reviewers
- There does not appear to be a common directive for the reviewers to assess the ES&H aspects of the facility, especially as it impacts the users.

Recommendations

- **Travel budget of the SUFD program manager should include sufficient funding for one trip/year by the program manager to each light source, for at least one trip to a major scientific conference and for one trip to an outstanding international light source.**
- **A formal follow-up of facility recommendations should be documented annually. Ideally this documentation would be a short response saying all issues had been previously addressed when appropriate.**
- **SUFD should continue its recently initiated practice of sending the facility director a copy of the invitation letter sent to the reviewers.**
- **The recommendation and facility response should be made available to the reviewers at the start of the review to allow the review committee to assess how the facility has responded to the prior recommendations.**

B. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected: (a) breadth and depth of portfolio elements, and (b) the national and international standing of the portfolio elements

Comments:

There is no clear documentation of how the review information is used to increase or decrease funding for the light sources. Without this information it is difficult to judge the impact of the reviews on the breadth and depth of the portfolio elements. Nevertheless, it is clear that the national laboratories take the reviews very seriously and that in an era of constrained budgets the importance of reviews is increasing as decisions need to be made to either terminate or initiate facilities.

As stewards of light source facilities in the United States, DOE plans for upgrading facilities to keep world class or leadership class status need to include transition plans to mitigate the near-term impact on the community. Important examples include the APS upgrade and the NSLS to NSLSII transition. Currently these documents are inadequate and are loosely defined in DOE planning.

We find that the breadth and depth of the facilities portfolio is excellent. All facilities foster and encourage cutting edge science via their peer-review PSP panels. All light sources should develop plans that would ensure world class leadership in forefront

science. We are particularly concerned about continued US leadership in UV/soft x-ray science.

Findings

- There is a broad portfolio of light sources with a balance of capabilities and geographic accessibility.
- The development of new techniques and instrumentation is considered part of the research portfolios of each of the large facilities, but the level of commitment is not clear within the budgetary constraints of running a facility and with the prospect that truly transformational advances may require new kinds of facilities.
- The facility review does not specifically cover the end stations/experimental facilities.
- The facility is not specifically asked to provide metrics that could readily be used to assess the international standing of the facility
- The career paths, responsibilities, and opportunities for beamline scientists (and other staff) vary widely among the different facilities. There is a uniform desire for beamline scientists to obtain independent funding and operate independent research programs
- There is no evidence of succession planning for critical positions at the light sources. This could impact national and international standing
- There is little emphasis placed on the review of supporting instrumentation/labs at the light sources

Recommendations

- **The quality of the end stations/experimental facilities should be assessed during the triennial review.**
- **A strategy should be developed to ensure a pipeline of skilled beamline scientists and engineers with the skills necessary to meet the demands of future US world-class light sources**
- **Each facility should establish well-defined and clear career paths for its staff. Attention should be focused on developing an improved method of providing and rewarding user support.**

Recommendations from 2010 COV

The 2010 COV made some specific recommendations (*italics*, below). These are delineated here with our comments.

- *A more balanced representation of the user and instrument communities on the review panel is recommended.*
    - The review panels were appropriately chosen.

- *The metric for "high impact" publications should be based on field-dependent impact factor of the journal rather than specific journal names. The metric should be uniform among all the facilities.*
    - We commend SUFD on implementing this metric.

- *A documented official letter of response should be provided to "closeout" the review (within a fixed period of receipt by facility director of guidance letter from SUFD).*
    - We commend the SUFD on implanting this recommendation.

- *The facility review should begin with a summary of how the facility addressed the recommendations from the prior review.*
    - This was not in the requested information to the facility directors, and we again make the same recommendation.

- The previous COV discussed splitting the facility reviews into science and operations reviews because the larger facilities the scope of the review was too large. We do not concur with this suggestion. We noted that all reviewers were given the same charge. Possibly subdividing the responsibilities of the reviewers could better meet the need to have an integrated review but at a manageable level.
    - This appears to occur *de facto*, but is not formalized.

- *Supplement the single metric of "user" with those of "research participant" as successfully used by the NIST Center for Neutron Research (co-proposers and co-authors of publications).*
    - This was not implemented, and is again recommended.

- *Specifically request that the quality of the end stations/experimental facilities available to users be part of the review process. Now that in many light sources the beamlines are facility owned and operated this responsibility falls under the purview of the light source and should be included in the review.*
    - We found no documentation for this recommendation, and again make the same recommendation.

2. Accelerator and Detector Research

A. For the scientific user facilities including the accelerator and detector program, assess the efficacy and quality of the processes used to: (a) solicit, review, recommend and document proposal actions (b) monitor active projects, programs and facilities.

- The solicitation of proposals is based on a broad announcement

- The process for reviewing and documenting proposals is appropriate for the present scale of the program
- The progress on proposals is documented annually by the PI and at the conclusion of each program with a final report
- Due to schedule constraints the final report is not available to the reviewers of renewal proposals.

B. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected: (a) breadth and depth of portfolio elements, and (b) the national and international standing of the portfolio elements.

- The resources available are so limited that the breadth is necessarily small (focusing primarily on free electron lasers and their associated technologies).
- The depth of the portfolio is well chosen especially considering the limited resources available.
- The portfolio included support of several workshops and these workshops were useful to set technical directions and for future planning.
- The national standing is excellent of all components of the accelerator and detector research is excellent.
- Internationally, there is significant and sustained investment in detector and optics technology. As a result, the international standing of much of the detector and optics research is behind overseas competitors. At present the international standing of the accelerator research is competitive, but could deteriorate unless the disparity in investment is remedied.
- Without forefront source and instrumentation capabilities the scientific user facilities may lose competitive edge in a fiercely competitive international environment

Findings

- Accelerator and detector research is supported through a combination of Facility operation funds, MIEs, SBIRs, and the Accelerator and Detector Research (ADR) program.
- The annual budget of the ADR is ~$10M (approximately 1% of the total SUFD portfolio). This figure is too small to maintain scientific leadership in the affected areas.
- ADR is vehicle for SUFD to encourage collaboration, broaden the pool of researchers, and target technical goals that benefit the full BES constituency
- Within the constraints of resource environment the projects are generally excellent and well matched to the needs of SUFD
- At present the portfolio includes accelerator and detector research but not the important area of x-ray optics

- Restricted travel funds for DOE personnel limit their ability to assess international standing and to facilitate collaboration.

Recommendations

- **We recommend that the ADR (ADOR!) portfolio be increased in size to $20M to $30M (2-3% of SUFD budget) per year.**
- **We encourage the consideration of concepts for a HUB or EFRC that would advance accelerator, detector, and optics technology in support of its scientific mission.**
- **We recommend that X-ray optics be added to the ADR portfolio (ADOR).**
- **As part of increasing the portfolio we recommend specific solicitations of opportunities for ADR research.**
- **As part of increasing the portfolio, we recommend formalizing the proposal solicitations. We realize this is likely to increase the ratio of peer-reviewed submissions to funded proposals. The continued use of white papers is encouraged.**
- **To continue the process of making program oversight more rigorous, we recommend that the program officer score completed projects with respect to how well project goals were met (such as 'goals met', 'goals partially met', etc.).**
- **We encourage the use of workshop reports to guide research initiatives and to shape investment priorities.**
- **We suggest development of topic specific metrics to assess / characterize the US capabilities in accelerators, optics, and detectors.**
- **Foster a pipeline of instrumentation, accelerator, and detector experts through an expanded early investigator program**

Recommendations from 2010 COV

The 2010 COV made some specific recommendations (*italics*, below). These are delineated here with our comments.

- *The procedures for treating R&D proposals from universities and DOE labs should be made as similar as possible. A proposal template would facilitate achievement of this goal.*
    - We do not concur with this recommendation.
- *Continuing the process of making review, funding and reporting requirements more rigorous and even-handed between universities and labs is encouraged .*
    - This issue was not observed in this COV.
- *The use of the SBIR resource has been pursued assiduously. It is recommended that when the "final" reports from the 2009 SBIR awards are available that a*

thorough review of the net result be made to determine the net value to the Program.

- This recommendation was not followed.

- *As the portfolio strategy develops, the use of solicitations to enhance areas of particular focus for the Program should be carefully examined. Possible examples include a) the current need for alternatives to ^{3}He based neutron detectors, b) hard x-ray imaging detectors, or c) determination of the rf-superheating field of MgB_2. It is important that a significant portion of the supported work be the result of unsolicited proposals to avoid over-constraint of the Program.*
    - We recommend that there are specific calls as the funding for the program increases.
- *Given that many of the accelerator and detector advances today are being made in Europe, the Program can derive great benefit by seeing the European accelerator and detector scene on the ground in the leading European laboratories. This experience will not only reveal what the competition is doing, but also provide contacts for reviewers of the frontier work that the DOE Program aspires to support.*
    - We concur with this statement; unfortunately highly constrained travel funding impedes implementation.
- *While reviewer comments are summarized and transmitted to the PI's in the case of declined proposals this summary is not supplied for accepted proposals. Doing the same for accepted proposals could provide useful information and ideas to the PI's of accepted proposals.*
    - This recommendation is now being followed.
- *For renewal applications it would be most helpful to proposal reviewers if the last annual report of the original proposal is included in the review package so progress achieved can be evaluated*
    - We make the same recommendation but understand the logistical difficulties. The summary reports from prior years could be made available.
- *As the portfolio strategy develops the balance between detector and accelerator R&D support as well as the balance among short, medium and long term R&D must be dealt with. The interface between work supported as part of facility development connected with operations and the R&D supported by this Program will also need serious consideration.*
    - Growth of the portfolio will need careful planning.

3. Neutron Sources

A. For the scientific user facilities including the accelerator and detector program, assess the efficacy and quality of the processes used to: (a) solicit, review, recommend, and document proposal actions and (b) monitor active projects, programs and facilities.

For the current period of this review (2010 – 2012), there were no new neutron proposals. There were reviews carried out (in 2010 and again in 2012) of the NScD. Programs at ORNL (which included the SNS and HFIR facilities). We were disappointed that the only other BES Neutron Program, namely that at the Lujan Neutron Science Facility at LANL, could not be reviewed by BES in this period. Consequently, comments on Charge 1 are be restricted to the reviews of SNS and HFIR.

The quality of the facility review process is high. The selection of reviewers has been reasonably well balanced, including accelerator, reactor, detector, and scattering-science expertise, encompassing academic, industrial, government and foreign representatives. Communications with the facility were efficient, and the BES-requested information was provided by the facility and to the reviewers in a timely fashion. Reviewers provided substantive reports, which were effectively summarized by SUFD. The electronic documentation of the reviews is well organized and straightforward to navigate.

We are pleased to note that, following a recommendation of the previous COV, the list of review issues provided to the reviewers was also provided to the facility prior to the review. As a minor comment, in the future it would be helpful to document this communication in the review Index file within the electronic records.

Finding: We find that the quality and efficacy of the SUFD review process for its neutron facilities is excellent and has helped to improve the performance of the facilities.

The reviews were particularly valuable for the SNS facility for which back-to-back reviews and the frank conveyance by SUFD to the facility management of negative findings in the 2009 and 2010 reviews resulted in several changes in management and in improved operational and scientific strategies. These changes whave met with the approval of the reviewers in the 2012 (latest) review.

B. 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.

We commend BES on remarkably managing to increase its overall budget by over 60% over the last seven difficult years, and being able to steward its neutron facilities at ORNL very capably, enabling these facilities to maintain their world-class status.

We are, however, disappointed in the lack of an aggressive strategy for elevating the Lujan Center at LANL to world-class status, while understanding that absence is mainly due the Lujan center falling into a grey area of joint stewardship with the NNSA. The Lujan Facility is now operating reliably at the neutron output level of the ISIS facility in the U.K. It has a high-quality scientific staff, and could be a valuable second resource for the U.S. neutron scattering community, particularly in the western United States. However, it suffers from a lack of the staffing and infrastructure which could make it a world-class facility.

We also note that, in spite of its age, the HFIR facility still contributes a large share of the publications from the ORNL facilities in high-impact journals. In addition HFIR is important to the nation in other ways, such as isotope production and radiation damage studies. In our judgment, a vibrant user program at ORNL must involve both the SNS and HFIR. These facilities have complementary capabilities. Without question some science could be done equally effectively at either facility, but other experiments clearly benefit from the use of one type of source or the other.. To support as large a user base as possible, the COV recommends that every effort be made to ensure a vibrant user program at both facilities in a combined neutron science program. There is also clear justification for the development of a second target station at the SNS, but the technical details have not yet been developed.

(1) Neutron Study

Finding:
Since the last studies on the future of neutron science in the United States (Neutron Sources for America's Future, 1993; Report on the Status and Needs of Major Neutron Scattering Facilities and Instruments in the United States, 2002), the trends in the science enabled by neutrons have evolved significantly.

Recommendation:

> **We recommend that BES join with other agencies, such as DOC, NSF, and NIH, in assessing the current status and future directions for neutron science in the U.S., which would include neutron measurement capacity and capabilities needed to enhance the international competitiveness of the U.S. scientific community.**

(2) User Metrics

With regard to metrics for assessing the impact of the BES-operated facilities, such as the number of users, we noted that there are inherent weaknesses in relying on any single metric to assess facility impact, and obtaining a meaningful perspective on impact requires looking at a variety of indicators. When visiting the BES website or seeing a presentation on the BES user facilities, the one metric that is most frequently presented is number of users. Taken on its own, this number can be misleading as a measure of impact or facility use. It underestimates the impact of a facility by only counting badged users that perform the experiment but neglects the badged users' collaborators and those who exploit the mail-in program. The previous COV recommended using a supplementary

metric, known as the *Research Participant* metric, which has been used by the NIST Center for Neutron Research and the NIST Center for Nanoscale Science and Technology for many years.

Finding :
The SUFD staff did not follow the recommendation of the previous COV regarding facility performance metrics.

Recommendation:

> **The neutron facilities should track a new supplementary metric, intended to reflect facility impact that would include not only on-site facility users and mail-in users, but also collaborators on successful proposals and co-authors on resulting publications, counting any name no more than once per year.**

This metric need not replace any of the current metrics. In fact, it can be used for internal facility management purposes.

(3) Sustainable User Operations for Neutron Instrumentation at BES Neutron Facilities

With regard to instrumentation at the Neutron Facilities, the subgroup discussed long-term staffing needs and methods for increasing the number and scope of the instruments at the facilities.

Finding :
It is not reasonable to frontload the facilities with instrumentation or beamlines that are understaffed and not able to support a vibrant user community.

Recommendation:

> **When an MIE for an instrument or beamline is being considered, a the facility should have well-designed plan to ensure its robust, long-term operation for users**

(4) Cooperative Stewardship for Neutron Instruments

Most instruments at the BES neutron scattering facilities are operated under the model in which DOE-BES is the single steward, solely responsible for all aspects of the facility including supporting construction, management, operations, maintenance, upgrades of the source and instrumentation, and providing support for a user program. A key component of a vibrant user facility is a robust, in-house research program, typically carried out by staff scientists. A high-quality, in-house research program is of enormous benefit to the user facility because it helps to attract good science and new users to the facility.

An alternative approach that has proven effective is the establishment of instrument partnerships with agencies and organizations whose core competencies are different from and complementary to those of the steward agency. In this steward-partner model, the

partner works closely with the steward agency on the planning, development, construction, operations, and maintenance of a scattering instrument or suite of instruments.[1] Such partnerships can attract new users who produce new, high-quality science, and thus amplify and broaden the impact beyond that of a single-agency stewarded facility. There is at least one instance in which discussions are taking place by facilities' management for establishing such a partnership. These should be encouraged by SUFD.

Finding:
There are few instruments operated in ORNL's Neutron Sciences Directorate that operate in the steward-partner model.

Recommendation:

> **BES and SUFD should strongly encourage the neutron scattering facilities to explore the formation of partnerships on instruments with potential partners from other agencies and organizations in the cooperative stewardship model to fully exploit the neutron scattering capabilities for the benefit of the broadest possible scientific community.**

(5) Ancillary Equipment and Software Development

The files of reviews of the SNS document deficiencies in the available sample environments and data analysis software. Clearly delineated improvements were recommended as high priority items to establish a vibrant user community. Subsequent reviews of the SNS demonstrate that the SNS has been responding to these issues with a change in leadership and documented strides in special sample environments and analysis software. It is also clear that this task is not yet complete and that close oversight and monitoring of the progress in these areas by SUFD is essential. These important components of a "user-friendly" facility will attract a large number of users and will enhance the scientific productivity of the SNS.

Finding :
Full utilization of the capabilities of the current facilities and performance of forefront research require the availability of specialized sample environments for experiments and software to collect and analyze data in an effective and efficient manner. Currently such user resources are decided on and funded by the facilities out of their operating funds.

Recommendation:

> **Funding avenues similar to the MIE (but on a size scale <$5M) should be available to all scientists (including users) to expedite the development of "ancillary" equipment or software packages to enable effective use of the facilities.**

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[1] *Cooperative Stewardship: Managing the Nation's Multidisciplinary User Facilities for Research with Synchrotron Radiation, Neutrons, and High Magnetic Fields*, Committee on Developing a Federal Materials Facilities Strategy, National Research Council (1999).

(6) Travel Budgeting for BES Program Managers

SUFD program managers are expected to oversee a portfolio of neutron user facilities that are intended to serve a broad range of potential users. They are tasked with maintaining or enhancing the breadth and standing of these capabilities at both national and international levels. Each facility is typically reviewed once every three years, with the review taking place at the facility over approximately 2.5 days. Under present budgetary constraints on travel funds, the triennial review is the only time that program managers can visit each facility. Furthermore, there is no opportunity for program managers to travel to a national or international meeting on neutron scattering science and instrumentation.

Finding :
The committee finds that current travel constraints on SUFD management staff are inconsistent with sound management principles. This practice hinders managers from accurately monitoring the performance of the facility and staff.

Recommendation:

Increase the SUFD Program Managers' travel budget to be commensurate with the mission of the BES SUFD.

4. Nanoscale Science Research Centers (NSCR) and Electron Beam Microcharacterization Centers (EBMC)

4.1 Nanoscale Science Research Centers

General Comments:

NSRCs are remarkable national resources for nanotechnology research and are productively serving as user facilities. They are diverse, broad in scope and have attracted and retained highly talented staff with impressive research projects and publications. Most are now reaching a new phase in their life, that of steady state operation, which brings new challenges as they grow their user programs up to and beyond capacity. In addition, a planned merger of the NSRCs and EBMCs will bring new challenges to managing these programs. Our comments in this and the next section (Electron Beam Characterization Centers) examine the program management for the period 2010 -2012, but also are informed by this anticipated merger.

Specific Responses:

A. For the scientific user facilities including the accelerator and detector program, assess the efficacy and quality of the processes used to: (a) solicit, review, recommend, and document proposal actions and (b) monitor active projects, programs and facilities.

Comments:
The subpanel primarily reviewed the DOE triennial review process of the five Nanoscale Science Research Centers covering the period 2010, 2011, and 2012.

Our assessment of SUFD efficacy and quality to review the EBMCs are rated as excellent. We are impressed by the level of thought and work devoted by the SUFD management to craft the required documentation that facilities must provide, select the reviewers, carry out the review, and provide feedback to the facility directors. The process ensures that all facilities are held accountable for producing the best science from their facilities and for spending the operating funds in a responsible manner. We commend SUFD for their rigor in their review of the facilities.

Typically, SUFD management informs the director of the in advance of the date of their review and sends them a detailed list of required documentation that needs to be available to the reviewers before the review allow for additional material to be provided. The reviewers are picked carefully by SUFD, as evidenced by the reviewers' comments that are extremely informative and detailed as well as provide expert recommendation and guidance on how to proceed to maintain/increase successful performance. The reviewers are primarily from universities with some national lab participants and the occasional industrial researcher included. There is written feedback sent to SUFD that is then provided to directors by SUFD in a timely manner and the directors respond within 30 days to the points raised by SUFD based on the review.

Findings:

- Overall, the Triennial review process is well documented. The reviews are very thorough and provide detailed technical comments encompassing the different topical areas being pursued within the Nanoscience Centers. From the reviews it is evident that the appropriate technical expertise was available within the different review panels and mail-in reviewers, and that the program managers did a great job at selecting a diverse pool of knowledgeable external reviewers. The committee carefully examined the review documents to evaluate the manner in which the reviewer observations were summarized and presented to the SUFD management and then how these were focused further in the letter to the center director to request action plans. We found the process to be fair, with SUFD officials faithfully summarizing the results of the review and developing an action plan and areas of future focus.

- Most of the current assessment process relies on a three year review cycle, which in some cases might be an excessively long period of time before a corrective action can be taken to address a given deficiency. Follow up on agreed to actions is therefore an important role of the SUFD program manager. The documentation provided to the COV is not sufficient to completely assess the efficacy and quality of the follow up processes used to monitor NSRCs, as it primarily focuses on the triennial reviews.

- To the point above, both the proposal and post award workflow process is not yet fully optimized. An electronic submission and tracking system would shed SUFD staff of a significant administrative burden related to these functions and provide the COV access to the documents needed to assess the follow up process.

- The unique operating model of the NSRCs differentiates them in many ways from the other facilities stewarded by the SUFD. Yet many of the assessment methods were "borrowed" from light source user program methodologies and have not evolved since the centers were first commissioned.

- Career guidance for staff at the NSRCs has been an important topic discussed at many center reviews. We observed the detailed correspondence between a program manager and a Director of a NSRC, that described a serious effort to work out the communication and career track issues. This and similar activities at other centers is real progress and is to be highly commended.

- There have been a series of program manager changes at SUFD for NSRCs during the review period. This has been disruptive in the monitoring and planning process of the NSRCs .

- While the number of industrial users has increased, the NSRCs have not attracted a significant number of industry users. The proposal evaluation process typically has no category for assessing potential technological or economic impact. Language in the NSRC user agreements typically presents legal barriers to industrial users.

- On occasion there appears to be mismatch between the demand for and productivity of a particular tool or facility within an NSRC and the resources devoted to supporting that tool or facility. In some of the review documents, users expressed concerns about the lack of accessibility to certain major equipment due to the allocation of instrument time among local users versus external users. This concern extended to the selection of "unbiased" reviewers for instrument-time allocation at the centers.

Recommendations:

- **In addition to the ongoing monthly phone-conferences, the COV panel felt that more face-to-face to time was needed between DOE officials and the administration, scientific staff, and user community of the Nanoscience Centers and E-beam facilities, including more regular (yearly) on-site visits**.

Such visits would allow DOE officials to obtain direct input on the day-to-day operation of these facilities by interacting not only with the top administrators, but also with the employees conducting the science. Such effort is expected to contribute to fostering an environment leading to excellence in science, the main mission of

DOE. Travel funds (one visit to each NSRC facility per year) should be allocated for this purpose, since it is considered key for the efficient use of existing DOE resources through the further optimization of existing research centers.

- **There needs to be some guidance provided to centers to plan for expansion of facilities (more on this below) or extended operating hours. Alternatively, the scientific community should willing to accept higher user project rejection rates which will limit the productivity.**

- **NSRCs are sufficiently differentiated from light sources and related facilities to warrant tailored assessment tools that evaluate the appropriateness of the goals set for these centers and their ongoing performance. The user satisfaction survey used by the NSRCs is more suited to light sources and should be redesigned to better capture feedback relevant to the mission, goals and mode of operation of the NSRCs.**

- **It would be very helpful if the program managers gave a briefing to the COV group explaining the priorities, goals and expectations for the NSRCs, together with the management philosophy, metrics and processes used *beyond* the triennial review process.**

- **It is essential to recruit and retain an outstanding program manager for the NSRCs to ensure that they can successfully manage the transition from start-up to steady-state operation. In addition, the current program manager brings a lot of valuable experience from the light sources that could usefully be employed to refine the management and oversight processes in place for the NSRCs.**

- **We recommend the issue of career guidance be given continued attention at both reviews and during the more frequent communications between DOE program management and Center management until it has been satisfactorily handled for all the centers. This COV panel noticed the lack of a uniform set of metrics for the evaluation of the performance of the personnel involved in research at the Nanoscience and the development of a successful career path. The latter includes recognizing the distinct nature of the institution and their role at serving DOE's scientific mission .**

- **A list of high-impact publications for the evaluation of scientific excellence at these institutions should be generated. Other metrics could include monitoring the number of citations to all publications generated at these centers and the number of patent applications.**

- **DOE should strive to establish some mechanism (e.g., web-based) which would allow it to directly collect input from users at the Nanoscience Centers facilities on the operation (i.e. reliability, hours of open access, etc), quality of the user support, and access to major equipment. Some end-of-experiment**

surveys are currently available at the different laboratories, but as noted above require updating to reflect the distinct scope and specific characteristics of the Nanoscience Centers. Confidentiality should be preserved in order to ensure honest constructive criticism from the users.

- **SUFD management is encouraged to continue working towards the implementation of a more efficient system by taking advantage of web-based interfaces. Such implementation such as PAMS (already underway) should decrease the administrative overhead and would facilitate follow-up of outstanding recommendations or proposed actions and could help streamline communications between DOE officials and managers at the different Nanoscience Centers and E-beam facilities. In addition, such a system should enable easier access to relevant documentation to external reviewers.**

- **If an increase in the fraction of industrial users is desired, this fact should be clearly communicated to the NSRCs. In addition the proposal evaluation should include criteria that value factors other than scientific impact. We would encourage sites to streamline access methods and to investigate ways to reflect "breakthrough commercialization" as a criteria alternative to breakthrough science in the proposal process and to include industrial reviewers in the process while protecting company proprietary information.**

- **A review of user agreements should be undertaken with a view to removing barriers to industry users.**

- **A regular review of the NSRC budget allocations may provide an opportunity to identify instances where a reallocation of resources might improve the overall effectiveness of the NSRC including but not limited to high demand instruments.**

B. 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.

Findings:

- According to the reviews of external experts and our own assessment based on the summaries provided for the 3-year review of the centers, the quality of the scientific products resulting from ongoing research efforts is excellent, and there is a general consensus on the appropriateness of the distinct thrusts areas covered in each of the centers. Nevertheless, in some cases there were external

recommendations of narrowing down or consolidating the number of thrust areas supported within each center. In other cases the need for having a better-defined scope for a given thrust area was highlighted. Overall, however, the current portfolio aligns with DOE's scientific mission.

- Some DOE program managers provided very detailed summaries of the actions that required attention in response to constructive criticisms from external reviewers during the 3-year review, while others conveyed seemingly vague guidance. For example, a summary was sent by SUFD to a center asking them to address and respond to the reviewer's comments, with a note to exclude the comments which were not aligned with DOE's scope and mission. Such statement implies that the center directors should be able to judge which reviewer's comments have to be addressed, and which ones can be disregarded.

- Both type of user facilities have done a remarkable job at utilizing existing funding for the development of internationally visible research programs via the independent contribution of their in-house researchers, but even more importantly, through their support of the research activities of external users. The quantity of both components of this effort directly affects the research output.

- NSRCs are entering a post-ramp up phase in which they are fully staffed and facing issues of high demand for facilities and instruments, space limitation issues, and are in some cases experiencing over subscribed staff.

- The NSRCs have rapidly established internationally competitive research programs, but competition from overseas is relentless.

Recommendations:

- **External reviewers provided insightful recommendations during the on-site three-year review. DOE's officials are strongly encouraged to convey to Nanoscience Center and E-beam facility directors the importance of the prompt implementation of such constructive comments to optimize operations and to maximize scientific output. Doing so may require additional funding for a given institution, or a redistribution of available resources to implement.**

- **DOE should initiate a forward-looking planning process to identify quasi-major investments in EBCs (and NSRCs) facilities and instrumentation. This would provide a long-term vision analogous to way the large facilities are planned.**

- **Unambiguous letters should be provided by DOE to center directors regarding the need of addressing specific comments by the external reviewers.**

- **Additional staffing, extended hours and long-term partnerships between scientists at DOE's centers and external university and industrial users should be among the ideas considered as a means of increasing productivity on high end instruments.**

- **Program managers need to be aware of the progress of and strategies employed by comparable foreign operations. Information should be obtained directly by site or conference visits (1 per year).**

Carryover Issues from the Previous COV Report

Findings:

- The DOE guidelines for review ("the charge") is rather broad. The importance of the triennial review is evident and the reviewers are encouraged to explore all aspects of the center operation and management that affect its productive use. SUFD managers do, however, need feedback on specific topics to evaluate center performance. Therefore a more detailed guideline for reviewer responses will be helpful. We understand that this is in process.

- Capital requests were solicited by the previous COV and would be a way to evaluate the planned instrumentation investments in the various centers. These were not provided.

- From the information provided in the triennial reviews, career path issues continue to be a point of concern at some of the centers, but are starting to be satisfactorily addressed as outlined above. (see section 1).

Recommendations:

- **The new guideline, specific to the needs of the NSRCs should be developed in time for the upcoming triennial reviews of the NRSCs.**

- **We request the capital request list again for the next COV group. The process by which these awards are reviewed and decided upon would be a reasonable area for this committee to consider.**

5. Electron Beam Microcharacterization Centers

A. For the scientific user facilities including the accelerator and detector program, assess the efficacy and quality of the processes used to: (a) solicit, review,

recommend and document proposal actions (b) monitor active projects, programs and facilities.

The subpanel examined the DOE triennial review of the three Electron Beam Microcharacterization Centers conducted in 2012 and covering the period 2010, 2011, and 2012.

In our assessment SUFD's efficacy and its quality to review the EBMCs is excellent. We are impressed by the level of thoughts and work devoted by the SUFD management to craft the required documentation that facilities must provide, select the reviewers, carry out the review, and provide feedback to the facility directors. The process ensures that all facilities are held accountable for producing the best science from their facilities and for spending the operating funds in a responsible manner. We commend SUFD for their rigor in their review of the facilities.

Typically, SUFD management informs the director of the EBMC about four months in advance of the date of their review. SUFD sends them a detailed list of required documentation that needs to be available to the reviewers before the review. The reviewers are picked carefully by SUFD, as evidenced by the reviewers' comments which are extremely informative and detailed as well as provide expert recommendation and guidance on how to proceed to maintain/increase successful performance. The reviewers are primarily from universities with some national lab contributors and the occasional industrial researchers included. The written feedback sent to the EBMC directors by SUFD is timely (about 4 months after the review) and the EBMC directors respond within 2 months to the points raised by SUFD based on the external review.

Findings:

The committee was favorably impressed with the consistency of the documentation, with the comprehensive information requested and supplied by the sources during the review process and by the quality of the reviews. Record keeping was excellent.

Our specific findings are:

- We find the review process comprehensive, balanced, fair, and transparent to all facilities since they are *all* reviewed using the same major criteria.
- Reviewers did not all use the suggested guidelines in generating their reports.
- The reviewer reports were generally very positive for all three EBMCs. The three EBMCs are recognized by the scientific community as very important national resources, leading the development of transmission electron microscopy instrumentation and techniques for the world, making the most advanced instrumentation and expertise available to the user community, and performing world-leading research using this instrumentation.

- The reviewer positive comments were summarized in the letter from SUFD to the EBMC directors, with customized specific examples of positive feedback given for each.
- The suggestions for improvement and constructive critiques were not thoroughly customized for individual facilities and did not in all cases reflect the consensus suggestions of the reviewers. Instead, despite the detailed center-specific external reviews available to DOE for consideration, two identical broad action items were conveyed to all three EBMCs.
- All three EBMCs responded to the two suggested action items in a timely manner with varying levels of specificity. No further follow-up was noted in the files.
- There have been a series of program manager changes at SUFD for EBMCs and NSRCs during the review period. This has been disruptive in the monitoring and planning process of the NSRCs and EBMCs.
- For EBMCs, good progress on all previous COV recommendations were implemented. One item is still in progress: "the four centers (now including BNL) need to establish their own identities. Rather than acquiring the same hardware and capabilities, a unique capability should be developed in each one"

Recommendations:

- **Provide reviewers with clear templates to use to construct their reviews. This assures uniformity and that the correct questions are addressed.**
- **More detail and customization should be provided in summarizing the consensus improvement items from the reviewers.**
- **We recommend a new program manager for NSRCs and EBMCs be put in place as soon as possible, hopefully long-term. This person needs sufficient travel funds to visit the facilities under their management, especially initially.**
- **We recommend more frequent follow-up to the triennial review recommendations, including monthly conference calls and yearly reviews. Some documentation of these processes should be provided to future COVs.**
- **Ensure continued progress on the prior COV goal of establishing unique capabilities for each of the EBMCs. These unique roles should be very visible to the user community.**

2. Within the boundaries defined by DOE missions and available funding, comment on how the award process has affected: (a) breadth and depth of portfolio elements, and (b) the national and international standing of the portfolio elements.

The three EBMCs are recognized by the scientific community as very important national resources, leading the development of transmission electron microscopy instrumentation and techniques for the world, making the most advanced

instrumentation and expertise available to the user community, and performing world-leading research using this instrumentation. Since one of the two action items from this most recent triennial review of the EBMC is for the merging of the EBMCs and the NSRCs, this has the potential to greatly affect the breadth and depth of the portfolio elements and the national and international standing of the portfolio elements. Consequently, this will be discussed in detail.

Findings:

- The merger of EBMCs and NSRCs has been recommended as a response to the triennial review finding that the EBMCs were understaffed and underfunded to carry out their mission.

- For the EBMCs, TEAM was a revolutionary, game changing instrumentation program which redefined the state-of-the-art EM capabilities, and resulted in a new generation of commercially-available instrumentation for EM users worldwide. Unfortunately the completion of TEAM was not successfully followed up by a next generation instrumentation proposal of the sort commonly seen at the completion of light source and neutron projects. There has not been a process to develop a community supported vision of future EM instruments.

Recommendations

- **Great care and thoughtful planning will be necessary to preserve the visibility of the three EMBCs (plus the EM capabilities at Brookhaven) as national centers for electron microscopy. This will be essential to the continued recruitment and retention of top-quality staff and to ensure that the EM user community does not feel devalued.**

- **SUFD should ensure that merger plans are clearly focused to achieve the desired improvements in synergy and operational efficiency.**

- **Different success metrics may be necessary for the EBMC staff within the NSRCs as their current user program effort and performance metrics are likely different than staff at the NSRCs.**

- **Since in many cases the EBMCs are critical lab resources as well as national user centers, planning will be needed to ensure that Lab materials programs (ie non-Nano work) outside the NSRCs are given properly prioritized access to instruments in the new combined organization.**

- **SUFD and NSRC management should not underestimate the staff-related issues associated with merging the two missions.**

- **There needs to be DOE leadership for a forward looking planning process for quasi- major investments in EBCs (and NSRCs) facilities and instrumentation. SUFD should promote a single vision (roadmap) for the next-generation EM capabilities across the 3 EBMCs + CFN at Brookhaven, rather than create a competitive situation. This could be the subject of a workshop. This single vision does not imply similar and redundant equipment at each EBMC; instead, there should be a single vision consisting of unique and appropriate capabilities at each EBMC.**

- **The unique world-leading instruments associated with the EMBCs are in high demand but not now utilized optimally –staff funding is currently for 40 hour week, yet labs are open > 8 hours per day. Merger plans should include expanded staffing (>8h/day) on select tools.**

6. Construction Projects

Purpose and scope of the 2013 COV review.
The Construction Project subpanel reviewed and assessed the efficacy and quality of the processes used by SUFD to monitor active construction and Major Items of Equipment projects. A total of 14 projects were reviewed, six construction projects and eight Major Items of Equipment (MIE) as summarized in Table 1.

Construction Project review process description.
The subpanel identified the key relevant processes in this area, DOE O 413.3A and 413.3B and the SC OPA-led peer reviews of projects and reviewed and assessed the efficacy and quality of their use by SUFD staff. The subpanel discussed the elements of the charge with SUFD staff and reviewed records and detailed reports on the projects identified within the scope of the COV.

Metrics and User definitions.
Metrics utilized to evaluate the Construction projects and MIE component for the COV include standard cost and schedule indexes (Table 1) for the projects that are in progress, and final costs, schedules, and delivered scopes versus approved baselines for completed projects.

FINDINGS

- During 2010-2012, the SUFD managed approximately $175 million to $230 million of construction project work (both line items and MIEs) annually.

- The SUFD implemented the principles and practices of DOE O 413.3A and O413.3B to monitor and control projects, and were fully engaged with the SC OPA-led peer review process.

- For the period covered by this COV, the SUFD met, and often exceeded, the BES/GPRA goal of remaining within + / - 10% for cost/schedule performance of completed projects.

- SUFD Construction staff presented a data table (table 1) highlighting performance of projects within the 2010 to 2012 review period. SUFD metrics used to evaluate project performance were Cost Performance Index (CPI) and Schedule Performance Index (SPI) for ongoing projects and TPC and completion date achievement for completed projects. The projects presented were all within the performance metrics.

- The Government Performance and Reporting Act Performance during the FY2010 to FY2012 reporting period was as follows:

	2010	2011	2012
Schedule variance %	-.8	-4.2	-4.6
Cost variance %	.3	-.1	-.6

Performance Goal is +10% to -10% for Baselined Projects

- Project management performance metrics have become even more visible indicators of DOE performance for external stakeholders, such as OMB and the Congress.

- Extremely lean travel budgets have severely limited the opportunities for SUFD Program Managers to visit project sites. Consequently, there are fewer opportunities for face-to-face discussions between Field and Headquarters staff, as well as less cross-training and staff education about a broader portfolio of projects within SC.

- There has been 100% turnover within the SUFD construction groups since the 2010 COV review; additional staff changes in the near future are likely. Looking back even further, one 8-year long MIE project had seven different Program Managers.

- SUFD management believes that Critical Decision-4 (CD-4, Approve Project Completion) criteria for BES projects should be more challenging.

- The charge for this COV is not well tailored to suit the review of SUFD and especially construction projects.

COMMENTS

- The SUFD has been very successful in delivering projects on schedule, within budget and meeting the baseline technical performance parameters.

- SUFD management understands the distinct roles and responsibilities for Program Managers, as distinguished from those of the FPDs and OPA, in fulfilling line management responsibilities. Program managers, in particular, need to ensure frequent and open communication with both field elements and OPA. But, severely limited travel funding has dramatically curtailed trips by Construction Group Program Managers to project sites. SUFD management should determine the correct level of field presence for Program Managers that provides adequate Federal oversight, operational awareness, and fosters strong and open communication between field and HQ elements. On-site field presence, graded to project risk, should be appropriately balanced with use of remote communication tools in order to live within a constrained budget.

- Staff turnover has resulted in the need to frequently recruit new Program Managers (who often come in as external detailees), request additional support from OPA, and occasionally use SUFD facility operations program managers to oversee project work. It has historically been difficult to identify, recruit, and retain good PM staff in many parts of SC. One major consequence is the loss of corporate memory and expertise. Another is the burden of training newly hired personnel, without SUFD written procedures or documented lessons learned. Given the continuing turnover within the SUFD construction group, staff succession and workforce development issues are still present and could potentially negatively affect SUFD projects in the future. An explicit effort to address work force development is warranted.

- SFUD staff are aware of and sensitive to the lessons learned from the transition to operations at major BES Facilities completed in the recent past. Specifically, they are attentive to the need for closely involving the scientific user community in the planning and preparations for initial operations that lead to productive research in a timely manner.

RECOMMENDATIONS

1. **Examine Work Force Development options and implement one or more as appropriate to maintain successful project delivery.**
2. **Mitigate the negative impact of reduced travel funds. Balance onsite field presence with the use of communication tools (technology) to ensure that robust communication between program managers and the on-site members of IPTs is maintained.**
3. **Ensure that CD4 requirements are reasonable, broadly understood by all stakeholders, and fully achievable within the project budget. Effort should**

be made to manage and align expectations for what constitutes successful initial scientific operations.

4. **Tailor the charge for future COV reviews of construction projects to address the nature of this type of activity. Consider use of "360" type feedback from stakeholders including FPDs, Lab staff, OPA, etc.**

Table 1

				Performance Metrics				
Project	Line Item or MIE	TPC	CD	% Complete	Cum CPI	Cum SPI	Status	CD-4 Date
SING	MIE	$68.5M	CD-4	100%	0.98	1.0	8/2011	9/2011
PULSE	MIE	$11.2M	CD-4	100%	0.99	1.0	1/2011	2/2011
LCLS	Line Item	$420M	CD-4	100%	0.98	1.0	6/2010	7/2010
LUSI	MIE	$60M	CD-4	100%	0.95	1.0	2/2012	8/2012
USB	MIE	$35.1M	CD-4	100%	1.01	1.0	10/2010	8/2011
SING-II	MIE	$60M	CD-3, CD-4A	85.4%	1.02	0.99	2/2013	9/2014
NSLS-II	Line Item	$912M	CD-3	87%	0.99	0.96	2/2013	6/2015
APS-U	Line Item	$391M	CD-1	~8.8%	N/A	N/A	2/2013	9/2020
LCLS-II	TBD/Line Item	$405M	CD-1	~11.2%	N/A	N/A	2/2013	9/2019
NEXT	MIE	$90M	CD-1	~5.6%	N/A	N/A	2/2013	6/2016
PUP	MIE	$89.6-96.1M	CD-1	N/A	N/A	N/A	Terminated	12/2015
STS	Line Item	$800-1500M	CD-0	N/A	N/A	N/A	N/A	12 years
NGLS	Line Item	$900-1500M	CD-0	N/A	N/A	N/A	N/A	9/2023
TEAM-II	MIE	$14-18M	CD-0	N/A	N/A	N/A	Terminated	9/2016

DOE/BES
Scientific User Facilities Division
Committee of Visitors (COV) Review Panel
Germantown, MD
April 24-26, 2013

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Appendix

COMMTTEE OF VISITORS
Scientific User Facilities Division
DOE/Germantown Complex
April 24-26, 2013

AGENDA

Wednesday, April 24th, 2013

7:30 am – 8:00 am	Transportation to Complex ***(Bus will be provided at hotel)***	
8:00 am – 8:30 am	Security Entrance - Committee to Assemble in North Lobby to check in. Committee will then be escorted to **Conference Room: A-410** ***(Continental Breakfast Available)***	COV members and BES staff
8:30 am – 8:45 am	Executive Session, Committee Assignments (**William Barletta**)	COV members
8:45 am – 9:00 am	BESAC and COV Process (**John C. Hemminger**)	COV members and BES staff
9:00 am – 9:30 am	Welcome and Introduction to BES and the COV process (**Harriet Kung**)	COV members and BES staff
9:30 am – 10:15 am	Overview of the Scientific User Facilities Division and the peer review process (**James Murphy**)	COV members and BES staff
10:15 am – 10:30 am	Executive Session (**Conference Room: A-410**)	COV members
10:30 am – 10:45 am	***Break***	
10:45 am – 11:15 am	Q&A with Scientific User Facilities Division staff	COV members and BES staff
11:15 am – 12:30 noon	Executive Session – Review files • ***Construction Projects (Conference Room: F-441)*** • ***Light Sources, Accelerator & Detector Research Committee (Conference Room: E-401)*** • ***Nanoscience & E-Beam Committee (Conference Room: E-301)*** • ***Neutron Facilities Committee (Conference Room: G-426)***	COV members (BES staff on call)
12:30 pm – 1:30 pm	***Lunch***	DOE GTN cafeteria

1:30 pm – 4:30 pm	Executive Session – Review files • ***Construction Projects (Conference Room: F-441)*** • ***Light Sources, Accelerator & Detector Research Committee (Conference Room: E-401)*** • ***Nanoscience & E-Beam Committee (Conference Room: E-301)*** • ***Neutron Facilities Committee (Conference Room: G-426)***	COV members (BES staff on call)
4:30 pm – 5:30 pm	Questions and Answers with BES staff **(Conference Room: E-401)**	COV and BES Staff
5:30 pm	Adjourn for the day ***(Bus will be provided back to hotel)***	
	Dinner (on your own)	

Thursday, April 25th, 2013

7:30 am – 8:00 am	Transportation to Complex ***(Bus will be provided at hotel)***	
8:00 am – 8:30 am	Security Entrance - Committee to Assemble in North Lobby to check in. Committee will then be escorted to **Conference Room: A-410** ***(Continental Breakfast Available)***	COV members and BES staff
8:30 am – 9:30 am	Full Committee Executive Session (**William Barletta)** (**Conference Room: A-410**)	COV members
9:30 am – 10:30 pm	Executive Session – Review files • ***Construction Projects (Conference Room: F-441)*** • ***Light Sources, Accelerator & Detector Research Committee (Conference Room: E-401)*** • ***Nanoscience & E-Beam Committee (Conference Room: E-301)*** • ***Neutron Facilities Committee (Conference Room: G-426)***	COV members (BES staff on call)
10:30 am – 10:45 am	***Break***	
10:45 am – 12:30 pm	Executive Session – Review files • ***Construction Projects (Conference Room: F-441)*** • ***Light Sources, Accelerator & Detector Research Committee (Conference Room: E-401)*** • ***Nanoscience & E-Beam Committee (Conference Room: E-301)*** • ***Neutron Facilities Committee (Conference Room: G-426)***	COV members (BES staff on call)
12:30 pm – 1:30 pm	***Lunch***	DOE GTN cafeteria
1:30 pm – 4:30 pm	Begin Draft report and recommendations - • ***Construction Projects (Conference Room: F-441)*** • ***Light Sources, Accelerator & Detector Research Committee (Conference Room: E-401)*** • ***Nanoscience & E-Beam Committee (Conference Room: E-301)*** • ***Neutron Facilities Committee (Conference Room: G-426)***	COV members (BES staff on call)
4:30 pm – 5:30 pm	Executive Session **(Conference Room: E-401)**	COV members
5:30 pm	Adjourn for the Day ***(Bus will be provided back to hotel)***	
	Dinner (*on your own*)	

Friday, April 26th, 2013

7:30 am – 8:00 am	Transportation to Complex ***(Bus will be provided at hotel)***	
8:00 am – 8:30 am	Security Entrance - Committee to Assemble in North Lobby to check in. Committee will then be escorted to **Conference Room: A-410** ***(Continental Breakfast Available)***	COV members and BES staff
8:30 am – 9:00 am	Questions & Answers for COV Members and BES Staff	COV members and BES staff
9:00 am – 10:30 am	Complete Draft report and recommendations • ***Construction Projects (Conference Room: F-441)*** • ***Light Sources, Accelerator & Detector Research Committee (Conference Room: E-401)*** • ***Nanoscience & E-Beam Committee (Conference Room E-301)*** • ***Neutron Facilities Committee (Conference Room G-426)***	COV members (BES staff on call)
10:30 am – 10:45 am	***Break***	
10:45 am – 11:45	Full Committee Executive Session: Review and revise report (**Conference Room: E-401**)	COV members
11:45 am – 12:45 pm	Closeout Adjourn for the day ***(Bus will be provided back to hotel)***	
12:45 pm – 1:30 pm	Lunch ADJOURN (Except Team Leads)	
1:30 pm – 3:30 pm	Team Leads complete written draft report	COV members and BES staff
3:30 pm	Team Leads ADJOURN ***(Bus will be provided back to hotel)***	