Basic Energy Sciences (BES) Response to the Report of the Basic Energy Sciences Advisory Committee
Committee of Visitors (COV) Review of the BES Scientific User Facilities Division (SUFD)

Date of COV: April 24-26, 2013 (COV report approved by BESAC on July 25, 2013)
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BES appreciates the COV committee for its thoughtful deliberations and insightful recommendations, which the Scientific User Facility Division values and will implement to the extent possible with our staffing level and budget appropriations.

	COV Recommendation	BES Response
1	**General**	
	a) Enhance the effectiveness of program oversight by increasing the flexibility of SUFD manager interaction with facility managers to communicate with the facilities staff including via increased on-site presence.	a) BES will seek opportunities for SUFD program managers to increase interactions with facility managers.
	b) The move toward the PAMS database for review of proposals and awards is commendable and should be available to the next COV.	b) BES concurs and will implement this recommendation at the next COV.
	c) Finalize the set of uniform definitions for nanoscience centers. Include citations and patents among the nanoscience center metrics.	c) BES concurs and had already generated a consensus list of high profile publications which has been distributed to the NSRC directors.
	d) Additional new metrics that account for scientific impact should apply to all the types of scientific user facilities.	d) The metrics used by BES to evaluate user facility performance are aligned with the Office of Science policies. They include user demand, facility operating hours, facility reliability and publications. The addition of new metrics will be vetted carefully by the Office of Science.
	e) Place added emphasis on career development as well as on maintaining state-of-the-art experimental apparatus, sample environments and software at all facilities to maximize scientific productivity.	e) BES recognizes the importance of facility staff development and will continue to encourage DOE laboratories, as part of their management plan, to highlight career development opportunities. Facility directors are urged to stay abreast of user requests and needs for state-of-the-art sample environment equipment and for software

		enhancements to enable a more effective utilization of the facility instrumentation.
2	**Synchrotron Light Sources**	
	a) 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) BES recognizes the importance of program managers' interactions with the facilities and the overall scientific community at large. BES will seek opportunities for SUFD program managers to increase interactions with the facilities and to stay abreast of national and international scientific developments.
	b) 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.	b) BES concurs with the recommendation. Formal follow-up of facility triennial review recommendations will be documented.
	c) SUFD should continue its recently initiated practice of sending the facility director a copy of the invitation letter sent to the reviewers.	c) BES concurs with the recommendation and will continue to implement this practice.
	d) 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.	d) The facility recommendations and facility response have been made available to the reviewers and discussed at the start of the reviews.
	e) The quality of the end stations/experimental facilities should be assessed during the triennial review.	e) Information on the quality of the end stations/experimental facilities has been requested as part of the review materials and it is submitted before the review. The reviewers have been requested to evaluate the submitted information during the triennial review.
	f) 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.	f) BES concurs with the recommendation and will continue to seek funding opportunities such as Early Career Research Program to provide career opportunities for the next generation beamline scientists and engineers.
	g) 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.	g) BES recognizes the importance of facility staff development and will continue to encourage the facilities, as part of their management plans, to highlight career development opportunities.

	h) The facility review should begin with a summary of how the facility addressed the recommendations from the prior review.	h) BES concurs with the recommendation. A summary of the prior review recommendations and how the facility addressed the recommendations are provided to the reviewers and discussed during the executive session.
	i) 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).	i) SC is working on a uniform definition of "user" for all SC facilities. BES will follow the SC definition.
	j) 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.	j) The quality of the end stations/experimental facilities has always been a part of the review materials and the review process.
3	**Accelerator and Detector Research**	
	a) We recommend that the ADR (ADOR!) portfolio be increased in size to $20M to $30M (2-3% of SUFD budget) per year.	a) BES is committed to a robust research program. Implementation depends on BES programmatic priorities and budget availability.
	b) 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.	b) BES is committed to a robust research program. BES will explore the possibilities of a HUB or EFRC concept. Implementation depends on BES programmatic priorities and budget availability.
	c) We recommend that X-ray optics be added to the ADR portfolio (ADOR).	c) BES recognizes the importance of x-ray optics and supports R&D through the Accelerator and Detector Research portfolio. X-ray optics research topics are also included in the Early Career Program Funding Opportunity Announcement (FOA) and in the Small Business Innovative Research FOA. A BES sponsored optics workshop was held in 2013 to assess the state of the art and to develop prioritized research directions for future R&D.
	d) 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	d) The ADR Program is structured to provide opportunities to project proponents at any time, and applications are not restricted to a particular time during the fiscal year. Specific topics of research interest are included in the open solicitation for new, renewal, and

	realize this is likely to increase the ratio of peer-reviewed submissions to funded proposals. The continued use of white papers is encouraged.	supplemental applications for each fiscal year. BES will continue to encourage the use of white papers.
	e) 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.).	e) BES concurs and will implement this recommendation in future completed projects.
	f) We encourage the use of workshop reports to guide research initiatives and to shape investment priorities.	f) BES concurs and has recently sponsored two separate workshops on detectors (August 2013) and X-ray optics (March 2013) to assess the state of the art and to determine priority research directions. An earlier workshop was held in Sept 2009 on Accelerator Physics for Future Light Sources.
	g) We suggest development of topic specific metrics to assess/characterize the US capabilities in accelerators, optics, and detectors.	g) This has been done recently, see f) above. An essential element of these workshops was to assess the capabilities in accelerators, optics & detectors.
	h) Foster a pipeline of instrumentation, accelerator, and detector experts through an expanded early investigator program.	h) BES will continue to encourage Early Career applications on accelerator research, detectors, instrumentation for X-ray and neutron sources, in particular advanced optics instrumentation for X-rays.
4	**Neutron Sources**	
	a) 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.	a) BES is open to discussions to enhance neutron science in the U.S.
	b) 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	b) SC is working on a uniform definition of "user" for all SC facilities. BES will follow the SC definition. The number of co-proposers on proposals is tracked presently as well as number of publications for each facility.

	publications, counting any name no more than once per year.	
	c) When an MIE for an instrument or beamline is being considered, the facility should have well-designed plan to ensure its robust, long-term operation for users.	c) BES concurs with the recommendation and has implemented the requirement of a transition to operations plan as part of the DOE project management process prior to full facility operations.
	d) 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.	d) BES concurs and has encouraged the facilities to seek partnerships to develop instruments, specialized sample environments, etc., whenever feasible and to the advantage of all parties.
	e) 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.	e) Beamline and instrument development is prioritized by the facility management in consultation with BES program managers and funded from facility operating funds.
	f) Increase the SUFD Program Managers' travel budget to be commensurate with the mission of the BES SUFD.	f) BES will seek opportunities for SUFD program managers to increase interactions with the facilities.
5	**Nanoscale Science Research Centers**	
	a) 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.	a) BES makes use of all current communication channels such as participation at user meetings, triennial reviews, and facility director meetings, etc. as the budget allows.
	b) 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 be willing to accept higher user project rejection rates which will limit the	b) Discussions with the NSRCs have begun on identifying specific capabilities and instruments that are near capacity or oversubscribed and how to extend operating hours.

	productivity.	
	c) 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.	c) The BES user satisfaction survey is designed to capture the same user feedback for all BES user facilities. BES is open to further discussion with the NSRCs.
	d) 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.	d) BES concurs and a briefing was provided at the COV meeting to each committee group.
	e) 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.	e) A NSRC program manager (started on 6/16/2013) has a long working history with the NSRCs, along with academic research, industry and government agency experience.
	f) 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	f) BES recognizes the importance of facility staff development and will continue to encourage the facilities, as part of their management plans, to highlight career development opportunities. The evaluation of lab staff's performance is the purview of the M&O contractors. BES evaluates the operations and user program of the facilities on a triennial basis, part of which indirectly reflect the lab's management and staffing plan.

	mission.	
	g) 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.	g) BES concurs. A list of high impact publications has been generated and approved for the NSRC directors for use going forward.
	h) 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.	h) As part of the facility management process, users are asked to provide feedback after each experiment. A summary of the user comments is submitted to BES annually as part of the BES facilities questionnaire.
	i) 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.	i) Plans for adopting PAMS are underway.
	j) 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	j) The idea of adding potential commercial impact to the user proposal review criteria to increase the industrial user base was discussed with the NSRC Directors. However, any major changes in user proposal review criteria should be done across all BES or

	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.	perhaps even all SC facilities. The efficacy of such a change will be discussed with the SC User Facility Working Group.
	k) A review of user agreements should be undertaken with a view to removing barriers to industry users.	k) This has been and will continue as a topic of discussion with the NSRC directors and DOE General Counsel.
	l) 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.	l) The triennial reviews will assess the overall effectiveness of the NSRCs.
	m) 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.	m) BES takes into consideration the comments from all reviewers to provide a written summary of the reviewers' remarks, specific recommendations from BES that must be addressed and anonymous verbatim reports from the reviewers. BES incorporates the information learned from the triennial reviews of all facilities in planning the budgets.
	n) DOE should initiate a forward-looking planning process to identify quasi-major investments in EBMCs (and NSRCs) facilities and instrumentation. This would provide a long-term vision analogous to way the large facilities are planned.	n) A planning process for the Future Electron Scattering science and facilities is being developed.
	o) Unambiguous letters should be provided by DOE to center directors regarding the need of addressing specific comments by the external reviewers.	o) As noted in the response to item (m) above, BES provides the facilities with a written list of specific recommendations that must be addressed and for which the response is tracked until the action item is satisfactorily closed out.
	p) Additional staffing, extended hours and long-term	p) This has been and will continue as a topic of discussion with the

	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.	NSRC directors.
	q) 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).	q) BES will seek opportunities for SUFD program managers to stay abreast of national and international scientific developments.
	r) The new guideline, specific to the needs of the NSRCs should be developed in time for the upcoming triennial reviews of the NRSCs.	r) BES does tailor the triennial reviews of each class of facilities (e-beam, light, nano and neutrons) to best review their unique capabilities. A new guideline for reporting NSRC capabilities and instrumentation will be used at the upcoming triennial reviews.
	s) 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.	s) The list of capital equipment at the NSRCs will be provided to the subcommittee at the next COV.
6	**Electron Beam Micro-characterization Centers**	
	a) Provide reviewers with clear templates to use to construct their reviews. This assures uniformity and that the correct questions are addressed.	a) BES concurs. A template was given to the reviewers to use for the upcoming reviews.
	b) More detail and customization should be provided in summarizing the consensus improvement items from the reviewers.	b) BES takes into consideration the comments from all reviewers to provide a written high level summary of the reviewers' remarks. In addition, BES provides specific recommendations that must be addressed and anonymous verbatim reports from the reviewers.
	c) 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.	c) A Program Manager for NSRCs and EBMCs started 6/16/2013. The program manager will have opportunities to visit the facilities under his purview.
	d) 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	d) BES conducts regularly scheduled monthly calls with each operating facility. Program managers also attend facility user meetings based upon available funding.

	to future COVs.	
	e) 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.	e) BES will continue to evaluate the unique capabilities of each of the EBMCs through on going interactions with the centers and at the triennial reviews.
	f) 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.	f) BES concurs with the recommendations in 5 (f –j, and l). The 7/24/3013 NSRC & EBMC Directors' meeting was held to discuss the merger plans of these facilities to ensure successful implementation.
	g) SUFD should ensure that merger plans are clearly focused to achieve the desired improvements in synergy and operational efficiency.	
	h) 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	
	i) 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 (i.e., non-Nano work) outside the NSRCs are given properly prioritized access to instruments in the new combined organization.	
	j) SUFD and NSRC management should not underestimate the staff-related issues associated with merging the two missions.	
	k) There needs to be DOE leadership for a forward looking planning process for quasi- major investments in EBMCs (and NSRCs) facilities and instrumentation. SUFD should promote a single vision (roadmap) for the next-generation EM capabilities across the 3	k) A workshop is planned on the Future of Electron Scattering science and facilities.

	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.	
	l) 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.	l) See (f) above.
7	**Construction Projects and MIEs**	
	a) Examine Work Force Development options and implement one or more as appropriate to maintain successful project delivery.	a) BES maintains an excellent performance record on project delivery and will continue to recruit and retain highly qualified staff to oversee its construction projects and MIEs.
	b) 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.	b) BES concurs. Robust communications are currently being maintained using communication tools available to the program managers. For every onsite CMIE review, one or more supplemental reviews are conducted by video conference. Conference calls are conducted at least monthly and as frequently as weekly with each CMIE project.
	c) 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.	c) BES concurs. The program strives to manage and align expectations for the definition of successful initial scientific operations.
	d) 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.	d) BES will study the options available consistent with Office of Science procedures and requirements for the COV process.