FES Response to the FESAC Committee of Visitors Review of the Fusion Energy Sciences Program

Date of COV Visit to Germantown, Maryland: August 17-19, 2009
Date of Response: December 15, 2010
Program Point of Contact: Ed Synakowski (301-903-4941)

COV Recommendation	Program Response
II. Selected Findings and Recommendations	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds, and	
a. Use peer review consistently across all program elements to ensure quality, balance, and credibility.	FES agrees with this recommendation and will implement it, recognizing that different types of proposals are likely to require variations in review processes.
b. Employ carefully designed solicitations to respond to the needs within every program element.	FES agrees with this recommendation and will endeavor to make future solicitations as well designed and clear as possible.
c. Ensure that all solicitations are properly focused with clear expectations and criteria.	See the answer to previous recommendation.
d. Document the reasons for a selection or a declination in every folder.	FES agrees with this recommendation. FES program managers prepare a report that describes the overall process and the rationale behind the funding recommendations for each solicitation. FES will ensure that a copy of the report is placed in every folder.
e. Implement uniform and effective rebuttal procedures.	While FES currently uses a rebuttal process for most solicitations, this will be phased out, to ensure consistency of process across the Office of Science. Also, rebuttals will not be included in the new Office of Science grants management system.
f. Include reasons for declinations and/or some specific context for the selection outcome in the communication to the proposer, including the impact of outlier reviews and of rebuttals.	With present and likely future staffing levels, a customized letter to every applicant is not feasible. However, applicants are always welcome to contact program managers for further information.
2. Processes to monitor active awards, projects and programs:	
a. Employ web-based tools to facilitate reporting of progress and tracking of achievements.	Developing a portfolio management system is the responsibility of the Office of Science. FES has two representatives on the group developing the requirements for such a system and will communicate this recommendation to the group.

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B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
a. Take immediate steps to strengthen some of the hardest hit areas that critically impact the ultimate success of the domestic program.	Establishing appropriate program balance is always an FES concern. FES implements the strongest program that can be supported with available resources.
b. Urge the USIPO to announce its R&D needs and the teams selected to meet those needs more broadly to the US community.	The USIPO uses the US Burning Plasma Organization (USBPO) to disseminate R&D tasks to the US fusion community who may then submit proposals. In the future, FES will ask the BPO to post information on which teams have been selected to perform the ITER R&D tasks on the BPO web site.
c. Urge the USIPO to employ solicitations and peer review to assign those tasks that do not require rapid response.	ITER is a project, and the USIPO uses DOE-approved subcontracting procedures to advertise and select subcontractors to carry out project-related work.
d. Maintain records in FES of the R&D activities funded through the USIPO.	FES does not maintain records on subcontracts. For the tasks in question, the records are maintained by the USIPO.
e. Provide future COVs a charge that clearly includes the FES processes involved in selecting and monitoring major facility operations and construction projects, including ITER, as well as the research elements of the FES program.	The Office of Science has management processes in place to manage construction projects and Major Items of Equipment projects. These processes include a well-known and proven set of evaluations and reviews.
f. Develop effective and streamlined mechanisms to manage solicitations that foster interactions among theory, computations, and experiment.	FES agrees with this recommendation and will continue to foster interactions among theory, computation, and experiment.
g. Collect and analyze data on the Early Career Research Program participants and their institutions, including diversity, achievements such as tenure, and continuation of funding from FES.	The Office of Science is currently developing a portfolio management system. FES will suggest including such metrics to the development team.

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2. National and international standing of portfolio elements	
a. Define, collect, and analyze meaningful metrics.	FES will consult with other SC offices to determine processes they use for gathering program metrics. This will be used as input to determine the best approach for this office.
b. Obtain and employ modern IT tools for data collection and analysis.	See the answer to recommendation II. B. 1. g.
c. Restore the staffing level of both administrative assistants and managers to levels needed to carry out their responsibilities including the collection of data needed to assess the quality of their program elements.	FES is actively posting job openings and recruiting to increase the management capabilities of the office.

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III. Tokamak Program	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds,	
a. Document FES program manager rankings and decision rationale for all actions in the folders for all reviewed proposals.	FES will put a copy the report of the review process in each folder.
b. Include the programmatic rating decided by NSTX management in the folders for all NSTX collaborator packages reviewed.	FES accepts this recommendation. If a programmatic rating by NSTX management is used in the review process, it will be included in future reports.
c. Include the notification-of-proposal-disposition letter in each folder.	FES will include a copy of the letter in each folder.
2. Processes to monitor active awards, projects and programs:	
None	
B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
None	
2. National and international standing of portfolio elements	
a. Define, collect, and analyze meaningful metrics for the US tokamak contributions to the international fusion program.	FES will consult with other SC offices as to what metrics they use and will consider collecting this information as part of annual progress reports.
b. Encourage researchers to report significant contributions to international activities to help document the impact of the US fusion program.	Researchers at the three major facilities already do report such contributions in their weekly and quarterly reports and in their annual field work proposals. They also report such work through the ITPA and Burning Plasma Organization meetings.
c. Acquire and use modern IT systems to assist in gathering this information.	The Office of Science is developing a portfolio management system and has received input from representatives from all SC program offices. The information that will be collected and analyzed will be standard throughout SC.

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IV. International Programs	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds, and	
a. Develop more consistency in monitoring and documenting the processes used by the USIPO in soliciting R&D help from the US fusion community, and in selecting groups to provide that help.	There are basically two classes of ITER R&D. The first is the voluntary physics R&D, which is not funded and is carried out on a voluntary basis by the ITER parties. These tasks are solicited and documented through volunteer organizations, either the International Tokamak Physics Activity (ITPA) or the U.S. Burning Plasma Organization (BPO). The second class of R&D is the project R&D solicited and managed by the USIPO. USIPO conducts its procurements and awards subcontracts in accordance with its DOE Prime Contract and DOE approved purchasing system. USIPO conducts a vendor outreach program and advertises upcoming business opportunities on both the US ITER and Oak Ridge National Laboratory webpages, and sponsors vendor conferences and visits in the various technical areas of its work scope. FES manages the ITER project and the work of the USIPO using standard SC project management processes.
b. Urge USIPO to communicate the opportunities for such help in a manner that allows the USIPO to exploit the depth and breadth of expertise throughout the entire US fusion program.	See the previous answer.
c. Develop and implement a formal process for soliciting, awarding, and documenting bilateral, non-ITER, international collaborative activities.	International collaborations are three way arrangements between the foreign facility managers, the U.S. researchers, and DOE. They generally involve specific scientific capabilities or hardware and may be initiated by the U.S researchers approaching the foreign researchers to develop a collaborative proposal or vice versa. Collaborative proposals are peer reviewed and may be funded if the reviews are excellent, the research is of high programmatic importance, DOE has applicable international agreements, and funds are available. Given the need for three-way planning to develop collaborations, each collaboration is unique. Thus, it is not possible to develop a formal process for soliciting international collaborations.

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2. Processes to monitor active awards, projects and programs:	
a. Account for the resources contributed in support of ITER-related activities by all three tokamak programs for those activities not directly funded through the USIPO.	FES manages all of the work carried out on the three major facilities to make sure it is consistent with the FES mission. FES does this through annual planning meetings and Program Advisory Committees, quarterly progress reviews, site visits, weekly reports, and regular telephone calls. FES also separately tracks voluntary ITER R&D. Nearly all of the resources contributed by the three major tokamak programs to the non-USIPO funded international collaborative activities is managed as part of the ITPA Joint Experiments programs. The USBPO, which organizes such activities, includes them in its annual progress reports.
b. Document and evaluate the review and reporting processes for the bilateral, non-ITER, international collaborative activities and implement appropriate improvements.	The universities that participate in international collaborations include such collaborative activities as a part of their grant applications. The participation by labs is reviewed in the context of annual Field Work Proposals.
B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
a. Monitor and document the resources needed for all three tokamak programs to ensure that the balance of activities remains appropriate.	FES does this on regular basis through the use of research councils, program advisory committees, weekly and quarterly reports, and it is documented in the annual field work proposals from each of the facilities.
2. National and international standing of portfolio elements	
a. Develop and implement methods for systematically collecting and analyzing important scientific and technical contributions of the US fusion community to the international fusion research effort. Use modern IT techniques where appropriate.	Documentation of the U.S. contribution to ITER, which is the key element of the international effort, was raised by the NAS Committee for Review of U.S. Contributions to ITER Physics (CRISPP) in 2007. The USBPO prepared a report on several metrics to respond to this question. FES intends to use this format every two years, and FES will consider expansion of this approach to other international collaborations.

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V. Diagnostics Program	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds, and	
None	
2. Processes to monitor active awards, projects and programs:	
None	
B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
a. Use the restructured Junior Faculty program as a mechanism to bring new faculty into the Diagnostics Program.	FES plans to use the SC Early Career Research Program, which replaces the FES Junior Faculty Award program in Basic Plasma Physics, to recruit the highest quality people into the fusion program. Diagnostic proposals are included in the solicitation and are given the same consideration as all other proposals.
b. Move diagnostics that are reliably and effectively operating on a tokamak or an ICC from the Diagnostics Program to a machine's main research and operations budget as soon as possible. This will open up more opportunities for bringing in new diagnostics concepts and researchers into the Program.	This recommendation is the standard practice for the Diagnostics Development Program, and it will be continued.
2. National and international standing of portfolio elements	
None	

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VI. Enabling Research and Development (R&D) Program	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and application, to recommend award or declination of funds, and	
a. Use solicitations when initiating new activities to select the most qualified participants for funding.	FES agrees with the recommendation and will use solicitations whenever possible.
b. Employ carefully designed solicitations to strengthen the program when peer review indicates that program balance or quality needs to be improved, or that new ideas are needed.	FES designs its solicitations considering program balance and strategic direction as well as input from FESAC.
c. Prepare and have on hand a number of peer-reviewed activities that can be submitted as “shovel ready” proposals if funds are made available on short notice.	FES agrees with the recommendation, however, SC policy under 10 CRF 605 states "New or renewal applications shall receive consideration for funding generally within 6 months but, in any event, no later than 12 months from the date of receipt by DOE." In any case, FES generally has a number of proposals under consideration at any given time, which can be funded if additional funding becomes available.
2. Processes to monitor active awards, projects and programs:	
a. Peer review all Enabling R&D activities on a regular basis with a 3 to 5 year time scale and document the results so they are available to future COVs.	FES agrees with this recommendation and will require that Enabling R&D activities be peer reviewed on a regular basis starting in FY 2011.
B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
a. Review the VLT mission to evaluate the need and appropriate scope for this activity. Perhaps the VLT could evolve into a Fusion R&D Center similar to the Plasma Science Centers.	FES will implement a review of the Virtual Laboratory for Technology (VLT) mission.
b. Improve the depth in the materials area. Efforts to engage materials programs in other agencies or offices within DOE such as BES should continue to be pursued to help strengthen the research effort in fusion materials.	FES recognizes and is beginning to take steps to strengthen the programs within Enabling R&D portfolio including materials. In addition, FES is engaged with other DOE offices who have materials programs such as Basic Energy Sciences, Nuclear Energy and the National Nuclear Security Administration, to begin to develop collaborative activities on areas of mutual interest.
c. Implement the proposed joint initiative with FES, ASCR and BES on materials under extreme environments using a solicitation and peer-reviewed proposals.	See the answer to recommendations VI.A.1.a and VI.B.1.b.

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2. National and international standing of portfolio elements	
a. Take immediate steps to strengthen some of the hardest hit areas in the Enabling R&D Program that critically impact the ultimate success of the domestic program.	See the answer to recommendation VI.B.1.b.
b. In addition, peer review as soon as practical the overall Enabling R&D Program to assess breadth and depth, to determine if the balance among the various elements is appropriate, and if the overall funding level for Enabling R&D is consistent with the needs of the fusion program.	See the answer to recommendations VI.A.2.a and VI.B.1.b.

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VII. Innovative Confinement Concepts and Basic Plasma Science Programs	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds, and	
General Recommendations	
a. Continue to improve this kind of “decision” documentation, making sure to include the “decision” documentation in the relevant folders. We recommend that this be extended to other parts of FES where it has not yet been implemented.	This is the type of "decision" documentation that is referred to in answer II. A. 1. d. FES has been expanding this type of documentation to other parts of the program and, in the future, will include a copy of the report in each folder.
b. Specifically state in solicitations whether pre-proposals will be used to reduce the proposal list and/or as a way to strengthen the final proposals.	Pre-proposals are generally used for one or more of the following purposes: 1) to determine the suitability of the proposed research project to objectives described in the Funding Opportunity Announcement, 2) to assist program managers in lining up reviewers before the final proposals are submitted and, if the pre-prosals are peer reviewed, 3) to reduce the number of final proposals to a manageable number. FES will state this in future Funding Opportunity Announcements.
c. Specify in solicitations the maximum length of pre-proposals, and provide a well-defined format and well-defined review criteria.	FES agrees with this recommendation and implemented it for the ICC solicitation for non-labs which was issued on March 2, 2010. Format guidelines and details on the review process were also included in the recent SciDAC solicitation. The Office of Science has a well-defined Preapplication / Preproposal policy as part of its Grant Rules, Regulations, and Guidance (http://www.science.doe.gov/grants/preapp.html).
ICC Specific	
a. Improve communication with the community (for example in the solicitations) to make the FES commitment to competitiveness and transparency more apparent.	FES will continue to use open Funding Opportunity Announements to solicit proposals and will continue to post information on grants, cooperative agreements, and contracts on its web site when awards are made.
b. Develop and document the rationale used for choosing the type of review process (e.g. panel, mail, etc.) for a particular ICC proposal call. This could include defining the boundaries between review choices based on criteria such as institutional type, award size, maturity of research area, and proposal type (renewals or new).	FES will document the type of review used in each solicitation in the reports that are placed in each folder.
c. Disseminate the choice of and rationale for a particular review method to the proposers and reviewers.	When practical, FES will specify the type of review to be used in each solicitation.

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DOE-NSF Partnership within Basic Plasma Science Specific	
a. Work with NSF to ensure continuity in management, funding, and vitality of the NSF/DOE Partnership.	FES agrees with this recommendation and will work with NSF to meet its intent.
Plasma Science Centers within Basic Plasma Science Specific	
a. Document the decision-making process, including discussions and any additional selection criteria that impacted the decisions on proposals on the fund/no-fund borderline, and file that documentation in the proposal folders in a timely manner.	See the answer to recommendation II. A. 1. d.
b. For the Research-Center-type of proposals, convey more specific information regarding the final selection criteria than what is now contained in the "form" letter declining funding.	See the response to recommendation II. A. 1. f.
HBCU Program Specific	
a. Add a link to a description of this program somewhere on the FES website.	FES will add a link on its web site which describes the HBCU program.

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2. Processes to monitor active awards, projects and programs:	
ICC Specific	
a. Insure that standardized and consistent reviews occur at intervals appropriate to the program size and that these reviews are well documented.	FES will standardize reviews of ICC projects according to project size and will document these reviews.
b. Foster more consistent management practices.	FES will work to foster consistent management practices among the ICC program managers.
c. Finalize the FES report on the "lessons-learned" as quickly as possible.	A review of projects and project related documentation is outside of the scope of the COV charge.
d. Include the answers to the following questions in the report: Were there systemic reasons for why the course was not "righted" at an earlier time? Should the current project-management template (DOE 413.3a) be modified to lower the risk of this happening again?	See the above response.
e. Circulate this "lessons-learned" document, as well as the one generated by PPPL, among FES managers and have them reviewed by the next COV.	See the response to recommendation VII. A. 2. c.
f. When terminations occur in the future, minimize the time period between termination and subsequent peer-review of the projects to which the funds were re-directed or between termination and competitive application for the funds.	When projects such as NCSX are terminated and funds are redirected, FES will redirect the funds according to programmatic priorities. Research projects that receive funds will be peer reviewed during the next competitive review.
g. Ensure that the decision-making process with regard to the re-direction of the funds is as transparent to the community as possible.	The NCSX project was terminated at the end of FY 2008, and the planned redirection of the funds was reported to FESAC on November 6, 2008. The presentation was subsequently made available to the fusion community on the FES web site: http://www.science.doe.gov/ofes/FESAC/Nov-2008/FESAC%2008%20Nov%20Gene%20(4).pdf.
Basic Plasma Science Facility (LAPD) within Basic Plasma Science Specific	
a. Allocate adequate (travel) resources for the managers to follow up on the performance of a facility after a review raises concerns.	FES receives a fixed travel budget allocation each fiscal year and allocates it to meet all program needs as best as possible.
Inter-Agency Program "Atomic Physics for Fusion and Plasma Science" at ORNL	
None	
Inter-Agency Program "Determination of Atomic Data Pertinent to the Fusion Energy Sciences Program" at	
None	

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B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
None	
2. National and international standing of portfolio elements	
General Recommendations	
a. Implement a self-assessment process to evaluate the quality of the FES program portfolio by instituting systematic collection of a variety of metrics, e.g. prizes/awards, refereed publications, citations, foreign requests for run-time, invited talks, etc. These metrics should be useful for both FES and future COVs in evaluating the domestic and international standing of the portfolio and the effectiveness of the portfolio in achieving the program objectives.	See the answer to recommendation II. B. 2. a.
DOE-NSF Partnership Program	
a. The Subcommittee recommends that FES explore possible opportunities for a similar partnership with the NSF Materials Sciences Division for the purpose of jointly funding research relevant to material-plasma issues.	FES agrees with this recommendation and will explore such opportunities. The NSF/DOE Partnership in Plasma Science and Engineering is conducted under the auspices of a Memorandum of Understanding (MOU) that is signed by DOE and NSF. FES has had initial discussions with NSF on such issues of common interest.
ICC Program	
None	

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VIII. High Energy Density Laboratory Plasma (HEDLP) Program	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds, and	
Solicitation Breadth	
a. Avoid issuing solicitations that would involve a major fraction of the S&T community apply for funding by further spreading out the renewals and by refining the technical and programmatic scope of future solicitations. For instance, separately timed solicitations for centers and for single investigator grants would clarify the process from proposal initiation through award.	FES will consider modifying the approach to solicitations as the program matures.
Proposal Evaluation	
a. Clearly explain the decision priority of the program managers in future HEDLP solicitations and instruct the reviewers to score the program relevance in a separate category. Especially if the solicitation is being run by more than one funding office, it is important to clearly define up front the selection criteria and evaluation priorities, both in the solicitation to the investigators and to the full cadre of reviewers at the time of the review.	The categories used in peer reviews are specified in 10 CFR 605. FES defines the review criteria to be used in the solicitations and will continue to do so in future solicitations.
b. Send rebuttals to the reviewers so that there is an opportunity for the numerical scores across the reviewer pool to be more consistent. The program managers making the funding decisions should also pay attention to the score spread, to avoid the possibility of an outstanding proposal being simply disqualified because of a reviewer misunderstanding which leads to one anomalously low score. The use of review panels would, further, enable more expert opinions to be given on each proposal, and also foster important normalization of numerical scoring procedures across the broad base (multi-disciplinary and international) of individual reviewers.	(1) Send rebuttals back to reviewers: This is generally not practical within the time constraints--grants have definite renewal dates. (2) Program managers should pay attention to the score spread: All FES program managers already do this and decise how to proceed on a case by case basis. Peer reviews are advice to the program managers, and they are careful to consider the information contained in all evaluations. (3) Use review panels: FES recognizes the value of review panels in certain situations and will consider their use as appropriate.

c. Include notations in the individual folders, particularly when decisions do not follow a simple threshold on the numerical scores. This recommendation is in concurrence with the prior COV.	FES agrees with this recommendation and will put a reference to the summary report in individual folders.
d. Write more informative funding decision declination letters to PIs. This should be standard practice. This recommendation is in concurrence with the prior COV.	See the answer to recommendation II. A. 1. f.
e. Provide the opportunity for a formal debrief upon request from the proposing investigator.	See the answer to recommendation II. A. 1. f.
2. Processes to monitor active awards, projects and programs:	
a. Metrics documentation: Document research achievements, impact of work, and recognition of accomplishments.	See the answer to recommendation II. B. 2. a.
b. Store this documentation in a straightforward format at the program office level and use it as a decision element in the project renewal process.	FES agrees with this recommendation and progress during a the previous performance period is one criterion used in reviewing renewal proposals. This documentation is stored in the form of annual progress reports in the project folders. However, storing it in a more readily accessible form will have to wait until the SC portfolio management system is implemented.

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B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
a. Portfolio balance: Close out programs as appropriate (such as those which, for instance, have next-step goals that are fiscally unrealizable in realistic 20 year timeframes), and launch promising new programs. The Subcommittee notes that the balance between providing sufficient funds to usher an investigation to fruition versus maintaining sufficient breadth is always a challenge with limited overall funding.	FES considers program balance on an annual basis.
b. Community input: Continue to make good use of community input (such as the Research Needs HEDLP Workshop 2009) in crafting future solicitations and in fostering excellence in this program.	FES will continue to seek community input.
2. National and international standing of portfolio elements	
a. Progress measures: Practice effective documentation of objective measures of progress and success at the program office level. This information will help in establishing the standing of the whole program and its merits.	FES agrees with this recommendation and will continue to explore what metrics and prograss measures are useful.

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IX. Theory and Computation Program	
A. Efficacy and Quality of the Program's Processes	
1. Processes to solicit and review proposals and applications, to recommend award or declination of funds, and	
a. Explicitly define what a “renewal” grant versus a “new” grant is in the solicitation. In particular, make clear whether this distinction applies to the scientific content (independent of personnel) or the personnel (independent of scientific content).	The Office of Science web site defines a renewal grant as "requests for additional funding for a period subsequent to that provided by a current award."
b. Consider requiring large proposals (>$1,000,000) be sectioned such that each section can be reviewed with multiple reviewers and ranked separately. This would ensure that these grants are evaluated with a resolution comparable to those of the smaller single investigator proposals in the same program. This would also facilitate decisions on partial funding of the large proposals to be made if certain modules are not of the same standard as others within the same proposal. This would minimize need to flat-line the budget of particularly strong sub-components of large grants, and better document the merit for funding	FES is doing this to a large extent and has included language in recent solicitations specifying that large applications with a scope of work encompasing multiple subject areas should be structured in such a way as to facilitate peer reviewing each subject area separately. However, grant applications from large groups must meet additional criteria, such as clear evidence of synergy among the various topical areas and/or work on complex problems requiring a team effort. Thus, they cannot be viewed as multiple independent proposals combined together which can be funded separately without affecting the synergy of the group.
c. Better document funding level decisions.	See the answer to recommendation II. A. 1. d.
d. Make more use of experimental reviewers as additional reviewers on theory proposals, where appropriate, to offer a perspective on the practical relevance of what is proposed.	FES is already doing this and will consider increasing the use of experimental reviewers.
e. Provide statistics about how often the same reviewers are used for the review of the same program in renewal projects. Ensure that Renewal proposals have at least one reviewer that is different from those used for earlier incarnations of that proposal in the previous review cycle.	FES agrees with this recommendation and will recommend that analysis and reporting capability be included in the SC grant management software. FES will ensure that in most cases two different reviewers are used for renewal proposals.

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f. Formally track and document statistics of the Early Career Research Program. In particular, keep data on demographics of investigators and institution diversity, whether or not investigators later received tenure, and whether or not they continued to receive funding from FES.	FES agrees with this recommendation and will recommend that the ability to collect data on these demographics be included in the SC grant management systems.
g. Explicitly emphasize the importance of validation through comparison to experimental data or to established code results as part of the solicitation, and encourage reviewers to consider this in their evaluations.	FES agrees with the COV on the importance of validation. This has already been emphasized in recent theory solicitations by including questions such as "How adequate are the proposed plans to validate, where appropriate, the theoretical predictions with experimental measurements?" under the Scientific and Technical Merit criterion and “If appropriate, have the applicants attempted to validate their theoretical predictions against experimental results?" under the Performance under Existing Award criterion.
2. Processes to monitor active awards, projects and programs:	
a. Standardize reporting on award progress: adopt an electronic on-line standardized grant reporting system (like NSF’s Fastlane) for which specific standard questions can be asked and specific expectations of the length of responses is given.	SC will be implementing a new, government-wide report format in its new portfolio management system.
b. For panel reviews of large DOE laboratory and large non-DOE programs, provide panel reviewers access to previous suggestions of past reviewers to evaluate how the laboratories have responded to recommended areas of improvement.	Peer reviews are generally not made available to other reviewers. In addition, the actual budget and scope of work for a research project are negotiated by the FES program manager after the panel review when the grant or contract is awarded. Thus, it is the responsibility of the program manager to provide appropriate guidance on how to assess past performance to the review panel.
c. Standardize the review process for all large DOE supported theory programs.	FES agrees with this recommendation and will continue to implement it in future solicitations.
d. Standardize the review process for large non-DOE laboratory theory programs.	FES agrees with this recommendation and will continue to implement it in future solicitations.
e. Increase site visits and use of panel reviews for the larger theory programs.	FES agrees with this recommendation and will continue to implement it in future solicitations, when appropriate.

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B. Effect of the Award Process on Portfolios	
1. Breadth and depth of the portfolio elements	
a. To better interface theory, computation, and experimental research, establish a new solicitation in which each proposal must have a theory/computation and experimental validation component. The criteria for funding should be strongly determined by the perceived effectiveness with which the proposed work will validate and constrain predictive theory/simulations.	FES agrees with the COV on the importance of close coordination between theory, computation, and experiment for the purposes of experimental validation and has emphasized this point in recent solicitations in the areas of theory, ICCs, and diagnostics. In addition, a well-coordinated comprehensive validation effort is part of the core mission of the Fusion Simulation Program (FSP).
b. Fund a series of small workshops (~30 people) once every ~3 years to identify and report progress on grand challenge problems and to give investigators advanced notice of programmatic priorities of upcoming solicitations.	FES has started a process within the theory program to develop a list of the key science issues in each programmatic area, the grand challenges, and a status report for each technical area. Program managers may use this information as one input into their program planning.
c. To foster innovation, change the review procedure of large proposals as recommended in Section IX.B.1 (p 37).	FES agrees with this recommendation and already does this to a great extent. Large grant applications are often reviewed by six or more reviewers selected to cover the range of topics in the application. FES will consider how to further implement this in future solicitations. Grant applications from groups must meet additional criteria, such as clear evidence of synergy between topics and/or work on complex problems requiring a multidisciplinary approach. Thus, they cannot be viewed as multiple proposals stapled together, which can be funded separately. Peer review is always considered in recommending funding levels.
d. Give advanced notice for solicitations that address specific high priority goals and questions (e.g. as identified by the workshops described above or like ReNeW), both at meetings and electronically.	FES agrees with this recommendation and will communicate plans and priorities in open public forums such as FESAC meetings and major scientific conferences, as well as on the FES web site.
e. Encourage and prioritize proposals that incorporate publicly (freely or commercially) available codes and development of codes that offer user-friendly interfaces for easy use and access by the community.	FES agrees with this recommendation and will emphasize the importance of implementing user-friendly interfaces and developing comprehensive documentation in future solicitations with a substantial code development component. Incorporation of publicly available codes should be consistent with commercial and open software standards.

FES Response to the FESAC Committee of Visitors Review of the Fusion Energy Sciences Program

f. Include multiple experimentalists for the FSP design review.	The FSP planning study will be reviewed by independent experts with a broad range of expertise, including experimentalists.
g. Implement a mechanism to facilitate inclusion of investigators not already in the original team, after the FSP design review.	FES is working with the ASCR to develop a management plan with a well-defined process for soliciting and selecting additional physicists, computer scientists, and applied mathematicians for the execution phase of the program.
2. National and international standing of portfolio elements	
a. Identify metrics to measure quality, productivity, and international standing (publications, citations, patents, presentations at international meetings, awards).	See the response to recommendation II. B. 2. a.
b. Build a database of publications from DOE funded research. This can be accomplished using the electronic template for grant reporting discussed above (as per NSF).	The possibility of electronic template reporting in the SC grant management software will be investigated.
c. Track the number of PhD students supported by program.	FES plans to adopt such metrics and will begin to collect this information as part of annual progress reports.
d. Build on existing international collaborations to increase sponsorship and involvement of FES that further encourages national and international collaboration initiatives in theory and computation.	Collaborations between U.S. and foreign scientists in theory and computation already exist and are expected to increase as the international fusion community prepares for ITER operations. FES agrees with the COV on the importance of these collaborations and will continue supporting and expanding them, as appropriate.