Report of the Committee of Visitors

Tokamak Research and Enabling Technologies

Report to the FESAC

Presented by David Gates

February 28, 2006

The COV Charge

- *The Committee was asked to review the way that OFES manages its program elements with respect to:*
  - *The complete review process involved in selecting proposals for awards*
  - *The manner in which progress is monitored*
  - *The connection between proposal awards and the overall program goals*
- *The Committee is also asked to comment on the following:*
  - *The breadth, quality, and portfolio balance*
  - *The national and international standing of the portfolio elements*

Program Elements Reviewed by this COV

- *Enabling Research & Development ($27M)*
  - *Plasma Technologies*
  - *Advanced Design*
  - *Materials Research*
  - *ITER Support*
- *Alcator C-Mod ($22M)*
- *Diagnostics ($3.7M)*
- *DIII-D ($55M)*
- *NSTX ($34M)*
- *MST ($6.3M)*

NCSX

- *NCSX was not reviewed by this COV, nor previous ones (however this COV understands that it was reviewed by FESAC).*
- *It is the most recently funded large project., so reviewing it would be useful from that perspective as well as understanding the process of monitoring construction projects as the fusion program enters the ITER construction phase.*
- *This COV recommends that NCSX be included in a future COV review.*

The COV Membership

- *Dr. Kathryn McCarthy, INL (Chair)*
- *Dr. Bruce Lipschultz, MIT*
- *Dr. David Rasmussen, ORNL*
- *Dr. Jeff Candy, GA*
- *Dr. Boris Breizman, Univ of Texas*
- *Dr. David Brower, UCLA*
- *Dr. David Gates, PPPL*
- *Dr. Andrew Ware, Univ of Montana*

The Process

- *A series of conference calls between the COV Chair and OFES staff took place to discuss the information needed by the COV*
- *OFES prepared written summaries of the processes used to review and select proposals; these were distributed to the COV prior to the meeting at DOE*
- *The COV reviewed results of earlier COVs*
- *A meeting was held at OFES headquarters on February 13-14, 2006 (details on next slide)*

The Process (con't)

- *OFES staff presented an overview of the processes used by OFES program managers, and gave the COV an opportunity to ask questions.*
- *After the presentations by OFES staff, the COV split into three groups to review proposal traffic.*
  - *The groups were formed such that there were no conflict of interest problems.*
  - *One group reviewed Enabling Technology and MST*
  - *The second group reviewed Diagnostics and C-MOD*
  - *The third group reviewed NSTX and DIII-D*

The Process (con't)

- *The proposals, reviewer comments, rebuttals and other documentation are kept in individual proposal "Folders" maintained by the OFES program managers.*
- *These Folders were provided to the groups and were the primary basis of their review*

General Observations

- *This COV agrees with recommendations of earlier COVs, and our report tries to focus on new recommendations rather than repeating earlier recommendations*
- *DOE program managers were very helpful in providing the requested information and answering questions*
- *Proposal Folders were well organized and generally complete (this was a result of an earlier COV recommendation)*

General Observations (con't)

- *Overall, it is clear that DOE is working to improve the programs and processes*
- *Overall, there was much evidence that the DOE program managers have already implemented many of the recommendations of earlier COVs*

General Observations (con't)

- *Different review/solicitation/recommendation for funding processes are used in different parts of these programs.*
  - *DIII-D and C-MOD do not have formal competitive review for university and industry collaborators, while the NSTX and Diagnostics programs do.*
  - *Enabling Technologies uses a mix of competitive and non-competitive review.*
  - *The mix of competitive and non-competitive review exists primarily for historical reasons.*

General Observations (con't)

- *In some cases the quality of the process relies on the expertise of the DOE program managers rather than on the process itself.*
- *Discussions with DOE program managers indicated that within DOE there is not an agreed set of metrics for deciding what type of review process to implement, but overall, the trend is towards competitive processes as recommended by earlier FESAC panels.*

General Observations (con't)

- *There is a general announcement (solicitation) every year, but it appears to be used only to accommodate proposals that should have been submitted to other calls, but for various reasons were not (for example, they may have missed a deadline).*
  - *Discussions with OFES staff indicated that they don't feel there is adequate budget to warrant funding proposals submitted to the general call*

General Observations (con't)

- *As the groups reviewed the reviews and proposals, they found that not all Folders included documentation on why decisions were made.*
- *Later discussions with OFES program managers indicated that this is being done now as recommended by earlier COVs, but wasn't done for earlier reviews.*
- *An additional observation is that suggestions for improving proposals that come from reviewers are not tracked.*

General Observations (con't)

- *The COV agreed that the quality of the reviews, proposals, and documentation was generally excellent for the larger and competitively reviewed proposals.*
- *The COV observed that the quality of the grant proposals and reviews was more varied for smaller, noncompetitive proposals.*

COV Responses to Specific Questions in Charge

Consistency between award decisions and the Office of Fusion Energy Science's programs and goals

- *Based on the sample examined by the panel, proposals that were funded were focused on OFES programs and goals*
- *Proposals that are funded are generally strong in both technical merit and programmatic relevance*

Monitoring of active programs and projects

- *The oversight of the major fusion experiments (DIII-D, C-MOD, NSTX, MST) is comprehensive and appropriate*
  - *progress reports from collaborators were not always included in the Folders, however the COV understands that this was remedied in later review processes*
- *In other parts of the program, the level of oversight is not always clearly documented in the Folders*
  - *the COV understands that this was remedied in later review processes*

How has the award process affected the breadth, quality, and balance of portfolio items

- *The panel has no basis to judge whether a different award process would result in a better portfolio*
- *Although different award processes are used in the programs, the overall impression is that the breadth, quality, and balance of portfolio items is good*

Recommendations

Recommendations

- ***The content of the Folders should be complete and consistent across the programs***
  - *This is similar to earlier COV recommendations, but this COV felt it was important enough to repeat.*
  - *It is clear that DOE is working in this direction, and Folders documenting more recent actions are generally more complete than those documenting earlier actions.*
- ***Statistics would be helpful to programs managers and future COVs, for example***
  - *Fraction of projects that are renewed*
  - *Funding awarded vs funding requested*
  - *Correlation between ratings and funding*
  - *Duration of contracts (that do not undergo competitive review)*
  - *Demographics for awards*

Recommendations (con't)

- ***The review sheet used for program renewals should explicitly include a review of progress***
  - *The reviewer should have a copy of the original proposal as well as the associated progress report*
- ***Some form of the proposal score should be communicated to the PI in addition to reviewer comments***
  - *It may be better to communicate the quartile in which the proposal fell rather than the raw score to compensate for variability in scoring and OFES management actions.*

Recommendations (con't)

- ***The reviewer pool size should be increased***
  - *This is important both to spread the work around amongst a larger number of reviewers, and to increase the overall quality of the reviews.*
  - *The COV recognizes that recruiting reviewers is very difficult as potential reviewers are very busy.*
  - *The COV recommends using more international reviewers, and using reviewers outside fusion (but only where appropriate).*

Recommendations (con't)

- *Are enough opportunities being made available to new/junior researchers and is there enough flexibility in the fusion program to be able to quickly incorporate discoveries and support new ideas?*
  - *NSTX competitively reviews university and industry proposals every three years, potentially providing an opportunity for new researchers*
  - *DIII-D doesn't have a formal re-compete process, but newcomers have an opportunity to get in through DIII-D management*
  - *While DOE does request new proposals via a general announcement (solicitation) every year, as mentioned earlier, this has never been used as a means to fund new/junior researchers*
- *This COV was unable to come to a conclusion on this topic, and felt that a focus on this issue in the future is needed*

Recommendations

- ***The Junior Faculty Award program should be eligible to those outside of basic plasma science.***
  - *During discussions with OFES staff, the COV learned that Junior faculty awards are eligible only to those working in basic plasma science.*
- ***FESAC (by itself or through a committee) should address two issues further:***
  - *Providing opportunities to young/new PIs*
  - *The balance between competitive vs non-competitive processes, especially for the collaborations on the large machines*

Conclusions

- *Based on this COV's review of the proposal Folders and discussions with OFES staff, it is the opinion of this COV that the OFES supports a high-quality research program in Tokamak Research and Enabling Technologies.*
- *The OFES staff is working diligently to improve processes, and thus the quality of the overall program*