

Committee of Visitors Report

Directorate of Engineering
Division of Chemical, Biochemical,
Environmental and Transport Systems (CBET)

Chair: Bruce E Logan

Co-Chair: John C Chen

Committee

- Bruce Logan, Penn State (Chair)
- John C. Chen, Lehigh (Co-Chair)
- Lance Collins, Cornell
- Richard Crooks, UT Austin
- Susannah Scott, UCSB
- Philbert Martin, U Michigan
- Marilyn Smith, Georgia Tech
- Shyni Varghese, UCSD
- John Tao, O-Innovation Advisors
- Eric Amis, United Technologies Research Center
- Linda Blevins, DOE
- Raul Miranda, DOE
- Larry Nagahara, NIH
- Subhas Sikdar, EPA

COV Report Structure

- 1) Quality and effectiveness of the merit review process
- 2) Questions concerning the selection of the reviewers
- 3) Questions concerning the management of the program under review
- 4) Portfolio Review (strategic areas, emerging areas, collaborations, transformative research)
- 5) Other topics (improvements, ways to improve performance)

Reviews

- Overall: 12,403
 - Awards= 1,877
 - Declinations= 10,384
 - Other: 142
- Number of Actions reviewed: 304
 - Awards: 152
 - Declinations: 151
 - Other: 1

Main findings- 1

- The percent success rate in proposal funding has fallen to be dangerously low
- The number of submissions has grown disproportionately large
- “Awards have become, too infrequently, inadequate to cover the minimum cost of the project”

Main findings- 2

- CBET is a remarkable program in NSF, consisting of excellent topics and having high quality staff.
- The program remains productive and the staff performance, positive attitudes, and enthusiasm prevail despite a high workload.
- This high workload remains an enormous challenge
 - From 2007 to 2011, there was a 69% increase in proposals, with only a 27% increase in budget
- COV had great concern that great ideas might not get funded due to the low success rate of proposals

COV Process

- Pre-meeting (only ~2 – 3 weeks)
 - Review of e-jackets
 - Review of CBET reports, plans and achievements
 - Preparation of preliminary summaries by sections
- Meeting (2 days in DC with CBET staff)
 - About half the time spent on Parts I-III, with rest of time in open discussion mainly focused on sections IV and V.
 - This length of open discussion (rather than a series of presentations) was unusual for a COV meeting (but very helpful), and is recommended for future COV meetings.

Part 1- Review Process

- Quality and effectiveness of merit review process VG to E, with improvements possible in:
 - Assessment of broader impacts
 - Completeness of documentation
 - Transparency of the decision (clarify reasons to the PI for the decision)

2- Selection of Reviewers

- Quality of reviews and reviewers were rated very highly
- Main concerns
 - More uniform balance in diversity of the panel in terms of gender, background, and location
 - Participation from industries and non-academics can improve process of engineering panel reviews

3- CBET Management

- COV commended leadership by John McGrath
- CBET has maintained positive attitudes of staff, and program managers show a high level of enthusiasm for activities despite high workload
- Main criticism
 - Lack of a clearer strategic vision, but workshops by CBET on this topic were encouraging and should lead to greater clarity in this area

4- Portfolio Review

- CBET is underfunded
 - This was noted by previous COVs, and it is a problem in general in Engineering (more so than many directorates in NSF)
 - CBET is a leader at NSF in trying to deal with this
 - Has gone to a “1 window” submission
 - COV recommends this be evaluated after 2-3 yrs
 - (Note: Biology has instituted even more strict measures, including 1 window, and a limit on number of proposals as PI)

4- Portfolio Review, continued

- CBET is making wise strategic investments
- Nanotechnology topic focuses on environmental aspects, and thus is different from other nanotechnology development areas in CBET and across NSF
- COV encourages participation in ICorps, GOALI and other bridging programs
- There was no concern regarding duplication of other agencies (e.g. NIH); rather there are many collaborations among these agencies that are beneficial
- Further elaboration on the use of EAGER funds in the future will be helpful, especially as the use of this funding approach may increase with 1-window funding

5- Other topics

- This was the first review following the merger of 17 programs into CBET, but that merger did not rise as an problematic issue
- Success rate of 11% (or less) is the main challenge for CBET, compared to an NSF average of 22%
- A funding level of \$100,000/project per year for 3 years is too low given current overhead, salaries and tuition
- No consensus was reached on trade off relative to increased award size at the expense of reducing success (funding even less proposals)

5- Other topics, continued

- The COV urges that support for strength in classic core areas be sustained. This is important for itself, but also to sustain the fundamental capabilities needed to quickly respond to new foci as they are identified.
- COV commended the outcome that 75-80% of funds were expended on unsolicited topics
- Many felt that there was too much variation in emphasis given to “Intellectual merit” vs “Broader impacts”. More uniformity needed?
- The existing NSF reporting system is antiquated, poorly organized, and in need of an overhaul
- Feedback on a panel meeting is needed:
 - Panelists should be polled post-panel review for their assessment of the process

Feedback on the COV Process

- Excellent summary talks given by CBET director, John McGrath
- Generally VG to E preparation by CBET management and staff, but...
 - Original agenda was too constrained; it was revised for more open discussion; future agendas should also be more open
 - Schedule was too tight for pre-meeting deadlines
 - A standard “working backwards” from target date needs to be established
 - List of common acronyms needed, along with list of funded projects for current portfolios
 - Multiple electronic sites for accessing materials was difficult; condense multiple files per person into one pdf

Questions/Comments?