

Report to the ASCAC of the COV held March 9-10 2004

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Charge letter

"The mission of the COV is: to evaluate how effectively the program adheres to the accepted policies, procedures and management of major program elements; and to provide an assessment of the processes used to solicit, review, recommend, and document proposal actions and monitor active projects and programs."

Attachment

“1. For both the DOE laboratory projects and the university projects, assess the efficacy and quality of the processes used to:

- (a) solicit, review, recommend, and document proposal actions, and
- (b) monitor active projects and programs.

2. 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.

3. Comment on future directions proposed by ASCR management and on opportunities that might not have been presented.

4. Comment on how the process for these reviews might be improved.”

Additional

- Are the best people in the associated areas, and the best proposals, being funded by ASCR?
- Have any proposals been funded that did not receive good reviews? If so, why?
- Are the most knowledgeable and informed reviewers being chosen?
- Have competition and peer review been used appropriately to guide major research expenditures?

The COV could not answer all
the questions in 1.75 days.

Programs reviewed

- Research in applied mathematics
- Research in computer science
- Research in laboratories

Findings - overview

- Programs are -
 - Generally effective
 - Reasonably well managed, given complexity, diversity, scope
- Program officers:
 - Dedicated
 - Competent
 - Know their portfolios & communities
- Each program has achieved significant successes

Findings - overview

COV found

- No decisions obviously incorrect or unjustified
- No instances where program was skewed, or there were marked deviations from normal standards of peer review

Findings - review process

- Reviewers clearly knowledgeable
 - Reviewer pool seemed small
 - COV uncertain of representativeness of reviewer pool
 - No reviewer pool data or statistics
- Panels occasionally seemed too small to ensure thorough representation of all sub-disciplines, or panel size incommensurate with the requested funding
 - In one case, a ~\$20m proposal was evaluated by a panel of 4 experts

Findings - review process

- Program managers exercise considerable but appropriate discretion in methods of proposal evaluation -
 - Mail review
 - Large and small panels
 - Pre-proposals + encourage/discourage full proposal
 - No documentation
 - No complete list of pre-proposals
 - Cannot comment on quality of pre-proposal screening process

Findings - review process

- Significant differences in handling & review techniques among programs and between national lab & university proposals
 - However, lab and university proposals appear to be held to identical **intellectual** standards

Findings - folders

- Considerable unevenness in detail, format, content, & organization of documentation
 - Some national lab folders lacked decision memos
 - No indices, tabs, or standard organization
- Large team awards documented in individual folders - one per Co-I institution
 - Difficult to obtain overview of team effort
- Significant differences between awarded & declined proposals

Findings - folders

- Significant differences between handling of national lab and university proposals
 - Style and format of folders
 - Lab folders generally less complete and less rigorous than university folders
 - Lab **renewals** less well documented and justified than **initial funding** recommendation
- Process differences between programs make comparisons difficult
- Geographic, demographic distributions for awards & declinations very difficult to obtain

Findings - folders

- In various cases, material in folders was insufficient to evaluate the complete train of events leading to the final decision
- Significant amount of data requested by COV had to be drawn from program officers' private filespace
- It was the sense of the COV that the folders were designed more for **fiscal** management than **program** management

Recommendations

- OASCR is developing program officer guidelines, and COV commends this effort
- Lab and university processes, including decision processes, need **not** be identical
 - However, both folder types should contain enough information to detail initial funding decision and track progress for renewals
- OASCR should develop a more comprehensive and consistent approach to program documentation, oriented towards **program** management

Research in applied mathematics

- Excellent management
- Good documentation
 - Clear decision memos based on analysis of reviewer comments
- Distinguished reviewers, size and representativeness adequate in opportunities seen by COV
 - At least three reviewers for each proposal

Research in applied mathematics

- Intrinsic quality of funded proposals high
- Some projects with strong initial reviews were renewed with less enthusiastic ones
- But at least one lab renewal was denied...
- Program officer is to be commended for the new initiative in multiscale mathematics
- Unclear how SciDAC funding acquired

Research in applied mathematics

Impacts -

- Computational modeling of combustion
- CFD
- Laser-plasma simulation
- Shock wave theory
- Prizes to PIs

Research in computer science

- Folder information insufficient to assess solicitation, review, award
- COV spent significant time in oral q&a with the program officer, whose patience and openness was very much appreciated by the COV
- Additional data from program officer's personal filespace

Research in computer science

- Folder did not allow COV to assess how each proposal was ranked relative to others evaluated
 - But no clearly incorrect decisions
- PIs, Co-Is, and reviewers seemed to be drawn from a very small pool & efforts to expand have been disappointing
- Mail reviews are asynchronous

Research in computer science

Recommendations

- Consider synchronous mail reviews to allow comparative evaluations
- Persist in attempts to widen reviewer pool
- Implement and formalize a consistent and uniform documentation process
- OASCR should establish guidelines on number of reviewers in relation to magnitude of opportunity

Research in computer science

Impacts

- Difficult to evaluate because of limited mission and small community served
- Development of MPI message-passing model & reference implementation
- Toolkits, e.g., OSCAR for managing Linux clusters
- Fernbach award to Dongarra

Research in collaboratories

- Well-managed, innovative with significant impact inside and outside DoE
- Review processes and documentation very good
- COV impressed by quantity of papers and reports from workshops
- Not clear program is open to researchers without existing ties to national labs
- Concern over stability of SciDAC funding which is a significant fraction of budget

Research in collaboratories

Impacts

- Accomplishments more than reasonable given age of program -
- Access Grid (>150 worldwide)
- GLOBUS middleware toolkit
- Electronic Notebook

General programmatic findings & recommendations

- Concern over talent pool and 'openness'
- OASCR to be commended for Early Career PI program: 20 new PIs in 2 years
- Work with CRA to publicize via CRN & Forsythe list
- Expand workshops at open conferences
- "Research corner" at SC

General programmatic findings & recommendations

- There is room for greater interaction between lab and university researchers
- Use collaboration technology to minimize travel for panels
- OASCR should assist in strengthening the relations between labs and academe

Strategic planning

- SciDAC
 - Basic function valuable
 - Should be sustained
 - Strategic review needed
 - Concern over openness, follow-through
- COV commends OASCR for advocacy for
 - ‘leadership class’ computing systems
 - Professional development, growing the community

Strategic planning

- Long-term focus is needed
- Multiscale mathematics essential to support real applications
- Planning needs to consider all possible high-end computing architectures, as well as grids
- Facilitate multi-agency approaches for efficiencies and market impact

COV process

- Regular COV will benefit DoE
- COV grateful for accessibility of key personnel during meeting
- Dinner meeting productive
- Additional material should be distributed well before meeting - requires staff preparation; e.g.: demographics by state, type of inst, diversity; success rate
- Additional material needed at meeting

COV process

- Logistical improvements
 - Standardize presentations
 - Talks should address COV charge issues
 - Expedite physical entry to site
 - On-site dirty net with printers
 - Enough paper handouts