Appendix IX

Academic Research Fleet Operations and Resolutions

NSB-97-224
November 13, 1997
RESOLUTION APPROVED BY THE NATIONAL SCIENCE BOARD AT ITS 346TH MEETING, NOVEM:BER 13, 1997 CONCERNING COMPETITION, RECOMPETITION AND RENEWAL OF NSF AWARDS

Whereas the Committee on Programs and Plans has outlined, at its meeting on November 13, 1997, the major principles and key issues in a report "CompetitiorL, Recompetition and Renewal-of NSF Awards: (NSB 97-216) in the context of the various types of NSF Awards; and

Whereas the Committee on Education and Human Resources concurs in the principles articulated in the report;

Now, therefore, be it RESOLVED, that the National Science Board:

Affirms its strong support for the principle that expiring awards are to be recompeted unless it is judged to be in the best interest of U.S. science and engineering not to do so. This position is based on the conviction that peer-reviewed competition and recompetition is the process most likely to assure the best use of NSF funds for supporting research and education. And Requests that the Director, NSF, take such steps necessary to ensure that NSF practices embody this principle.

NSB Statement
on
Competition, Recompetition and Renewal of NSF Awards

The commitment to merit-reviewed competition within the context of NSF's merit review criteria is a hallmark of the NSF grant/award making process. The principle of expiring awards to be recompeted follows from the conviction that peer-reviewed competition and recompetition is the process most likely to assure the best use of NSF funds for supporting research and education.

NSF awards range in size and complexity from individual investigator and small group awards, to large groups, centers, and to construction, operation and research use of national and international facilities. This paper outlines the major issues associated with competition, recompetition and renewal in the context of the special characteristics of the several categories of NSF awards:

1. individual investigators and small groups;
2. large groups;
3. centers;
4. construction, operation and research use of facilities for national and international user communities;

1. Individual Investigator and Small Group awards:

These represent, by nunber, the great majority of NSF awards. They are made typically for three years, in response to peer review assesmnents of proposals. Renewels require peer review of proposals and survival in the competition with every other proposal submitted for in the same research area. No special additional measures are required to assure competition. The key critieria are always those specified by NSF and approved by the NSB (reference the recent Grant Proposal Guide); management issues, per se, do not play a significant role.

2. Large Group Awards

Some large university groups receive continued funding over extended periods. It is important to periodically reassess these Large Group Awards (LGAs) to determine in which areas continuation may be needed and appropriate. One special issue in evaluating LGA renewal proposals is the need to determine whether individual. members continue to ment support. Another is that several subgroups may be funded under the large group umbrella, making it necessary to determine whether the subgroups individually merit funding. There is a concern that the group can buffer individual members and subgroups from competition unless NSF staff make special review arrangements. This raises concerns about management within the LGA..

We suggest that a review procedure be defined for LGA renewal/ recompetition, and that this procedure be reflected in an LGA-review form. The procedure should address explicitly reviews of any sub-groups within the LGA, as well as the question of whether otherwise less-than-competitive individuals are being supported. The LGA review should also ascertain whether sub-goups, if present, interact synergistically in important ways. The results of the reviews and the judgment of staff concerning the appropriateness of LGA support will determine whether a call for competing proposals should be announced.

3. Centers:

Many, but not all, center awards are limited to a maximum duration - typically on the order of 10 years - after which continued funding requires success in open, merit-reviewed competition The initially funded proposals are selected on the basis of merit review, and progress is monitored periodically to determine subsequent funding levels. Some center programs do not have explicit recompetition requirements. Among those that do, there is wide variation as to whether, and the extent to which, past performance is taken into account in evaluating recompetition proposals. We suggest that specific guidelines be established for the review and renewal of centers, with the aim of making the procedures as uniform and explicit as practicable. These procedures should also address the issue of phase-down of support for centers which are not in fact renewed.

4. Major Facility Awards

The complexity of these awards, and the associated community requirements, necessitate special considerations in implementing the NSF goal of full competition/recompetition. In all cases, it is essential that NSF determine periodically whether a particular facility still represents the best use of NSF funds.

a) Construction Awards:

These awards result from and require demonstrated community consensus that the facility is needed for progress in an important, high priority area of research. The decision to support a specific initial construction project or upgrade is based on the results of outside assesmnents of the scientific and technical merits of a detailed proposal, and proposed awards require NSB review and approval. Only in rare cases has NSF organized competitions to determine the awardee. Rather, the organization that developed the facility concept and secured community interest in its construction submits a unique proposal, and that organization assumes responsibility for construction, often subcontracting out all or part of the work. The subcontracts are often awarded on the basis of a competitive bid process. Through cooperative agreements NSF and the awardee normally share responsibility for monitoring progress through semiannual (or more frequent) technical reviews. We believe these procedures to be sound, but the increasing complexity of many construction projects dictates increasing attention to oversight.

b) Operation Awards:

Management of facility operations typically devolves on the organization that developed the facility concept and managed the construction phase. In a few cases this function is recompeted periodically. More generally, it is not. Unlike Centers, these facilities are often 'immovable'- or located at a unique site - and dependent for successful operation on a dedicated staff who are not interchangeable with scientists and engineers at other institutions. A further complication is that the facilities are sometimes established or upgraded with substantial cost-sharing by a host institution. In all cases there are organizational and management issues involved with the operation of large facilities, and hence NSF finds it necessary to conduct management reviews (as distinct from science reviews) at regular intervals and to provide feedback to the managing organizations, which also conduct such reviews. Occasionally, these reviews lead to the decision to recompete the management of the facility; the circumstances under which this could occur, as well as its consequences, need to be well-understood by all concerned. It is important that NSF provide proper guidance on how best to conduct these management reviews, along with defined review criteria and review forms. In particular, supplemental criteria addressing management issues should be used.

Even in cases where the management has been explicitly and rigorously reviewed and found to be effective, the benefits of competition may outweigh any short-term disadvantages of recompetition. NSF must determine periodically whether there is a better approach to managing the facility. The issue of a possible recompetition should be explicitly addressed as a regular part of the decision process for every such award.

c) Support and Research Staff at Major facilities

Major facility awards often include to support research by facility staff. Organizations such as NCAR, NRAO, NOAO etc., as well as a number of university-based facilities, employ substantial numbers of scientists and engineers. To the extent that these staff are essential to the operation and effective research use of the facility, their support should be reviewed in the context of the management assessments discussed above. The distribution of staff efforts between user services and research should be examined periodically.

Allocations of resources for staff research should be governed by rigorous merit review based on the standard NSF criteria. Many NSF programs impose additional supplemental criteria and these should be applied uniformly to external and in-house users of the facility, whether the is provided by the facility or directly by NSF. In the case of in-house users NSF may wish to delegate responsibility for conducting this merit review to facility management, while retaining responsibility for oversight. The Board recognizes that the mechanisms best suited to implement these principles may vary from facility to facility.

d) Special Rules for FFRDCs

For those NSF facilities that have the status of "Federally funded Research and Development Centers (FFRDCs), including several facilities listed above, special requirements apply to recompetition and renewal. These are spelled out in the FederalAcquisition Regulations, Part 35. Specific requirements for reviews include examination of the sponsor's continuing technical needs, consideration of alternative sources to meet those needs, assessment of the efficiency and effectiveness of the FFRDC in meeting the sponsor's needs and adequacy of the FFRDC management, and determination that the criteria under which the FFRDC was established continue to be satisfied. Such reviews must take place at least once every five years.

Academic Research Fleet Operations and Management Review

Context

- National Science Board reviewed request for continuation of Oceanographic Research Vessel and Submersible Operations awards for 5 years in November, 1997.
- Operations awards were approved for a shorter duration -- 2 years, 1998 and 1999.
- NSF staff are to review and report back on the cost-effectiveness of the present and possible alternative methods of managing ship operations
- Review procedures will follow principles outlined in NSB Resolution concerning Competition, Recompetition, and Renewal of NSF Awards for facilities operations (NSB 97-224).

Academic Research Fleet Operations and Management Review

Action

- Establish Academic Research Fleet Operations Review Panel
  - Six to eight members
  - Academic, industry, and government representatives

- Provide a comprehensive and balanced evaluation of science support services and capabilities, ship operations, and size and organizational structure for the support of the academic research fleet.

- Recommend actions by NSF to ensure the most cost-effective means of organizing and managing the research fleet for support of research requirements.

Academic Research Fleet Operations and Management Review

Terms of Reference

1) Review and evaluate the current and projected research vessel fleet required for research sponsored by the National Science Foundation within a national framework that includes research requirements of other federal agencies, state and local governments, and private sources.

   This review should be done in the context of environmental and geoscience research, in general, and the specific contributions the Academic Research Fleet provides to the research enterprise as a whole.

   Specific issues include:

   - Do the capabilities and operating modes of the academic ships meet research requirements?
   - Are the number of ships overall, and distribution within size categories, consistent with the level of research support and type of seagoing research projects expected in the future?
   - Are specialized capabilities required to meet research priorities adequately included in the overall fleet profile?

Academic Research Fleet Operations and Management Review

Terms of Reference

2) Review and evaluate overall management structure of the Academic Research Fleet; review and evaluate existing capabilities and services provided by the operating organizations; and review and evaluate possible future changes in academic fleet operations to ensure optimal operations of the academic fleet to support research requirements.

The review context should include consideration of the distributed ownership of the fleet, cost sharing for both capital acquisition and operations and requirements of multiple research sponsors who participate in scientific, operational and financial support.

Specific issues include:

- Are organizational arrangements and structures appropriate?
- Can the Academic Research Fleet system be managed in a more cost-effective manner?
- Should elements of the research fleet be recompeted?

Academic Research Fleet Operations and Management Review

Terms of Reference

3) Provide recommended actions by NSF to improve the organization, management, and cost effective operation of the Academic Research Fleet in support of scientific capabilities required to maintain world leadership in ocean and environmental science research.

   The recommendations should be formulated in the context of the results of the review and evaluations of the first two terms of reference. Key elements include providing a perspective on Academic Research Fleet operations within a national context, relevance and quality of scientific, educational, and technical support; and benefits and added value of any recommended actions for peer reviewed competition or recompetition of research fleet components.

Academic Research Fleet Operations and Management Review

Schedule and Report

- February 1998
  - NSB concurrence with review plans and schedule
- March 1998
  - Complete review committee appointments
- May - November 1998
  - Committee meetings
  - Formal input from:
    - UNOLS Advisory Structure
    - Federal Oceanographic Fleet Coordination Committee
    - Ship Operator Institutions
    - Sea-going scientists
    - Science programs
    - Industry
    - Office of Naval Research
- December 1998
  - Committee report and recommendations
- February 1999
  - NSF management response to NSB
  - management issues
  - cost issues
  - recompetition issues
- May 1999
  - Renewal of operations awards authority beyond 1999
  - Process and schedule to implement NSF management actions.