Origins and History of the NSF Committee of Visitors Process

The Origins of the COV Process[1]

The establishment of an external review committee (later known as the Committee of Visitors) was one of the NSF's responses to the pre-collegiate curriculum crisis, better known as the MACOS controversy. Briefly, in the 1960s and early 1970s, the NSF was increasing its funding for the development of science curriculum material for K-12. One of these curriculum packages was Man, A Course Of Study. It was a social science curriculum, heavy on anthropology, for 5th graders. It had some controversial aspects, especially the presentation, without criticism, of moral norms in other cultures which differed from US norms and the argument that man could best be understood as an animal.

The program was attacked on the floor of the House of Representatives in April 1975. The NSF's initial response to this criticism was to argue that the curriculum material had gone through an intensive peer review process and had been endorsed by that process and therefore, by the educational community. A major internal review by the NSF in mid-1975 apparently confirmed the support of the community for this and other K-12 curriculum packages.

At this point, the spotlight shifted from MACOS specifically to the peer review process more generally. During hearings in July 1975 before the House Subcommittee on Science, Research and Technology, a Congressman characterized the peer review system as “an incestuous ‘buddy system’” and contended that “it’s no trick to rig the system,” while the NSF continued to defend the process. But GAO investigations of MACOS and another program, ISIS (Individualized Science Instructional System), in late 1975 and early 1976 identified a number of problems, among which were misrepresentations of the peer reviewers. In early 1976, a second internal NSF investigation showed that the initial NSF investigation into the review of educational curriculum grant proposals was either, according to your point of view, incompetent or a cover-up. In fact, program officers, seeking sign-off from their superiors--and in some cases, the NSB--were found to have misused quantitative qualifiers like "all" or "none," quoted reviews out of context, selectively used quotes, ignored conflicts of interest, and even cited reviews which had been written for different proposals.

There were a number of actions by the NSF and the NSB in response to the MACOS controversy, including establishing the practice of providing verbatim reviews--initially upon request, and eventually, automatically--as well as a new form of external review of NSF activities. Having been “encouraged by our Congressional committees and by Members of the Board [NSB]” to provide “an improved oversight mechanism and evaluation activity at the Foundation,” on April 20, 1977, Richard Atkinson, then Acting Director, sent to the NSB a "Proposed Evaluation and External Oversight Plan." This Plan was immediately endorsed by the NSB. Atkinson distinguished between “oversight,” which focused on “operations and activities, priorities, program balance, and selection of awards”; and “evaluation,” which focused on the results of the awards. To provide external oversight, Atkinson called for the

[1] From NSF’s Historian, Marc Rothenberg.

generalization of a program that had been developed in Physics in 1972 for in-depth reviews by its Advisory Panel, establishing a three-year cycle of review for NSF programs.

In 1989 the procedures for the three-year cycle of external oversight were revised. The newly named "Committee of Visitors" process gave the Assistant Directors responsibility for developing topical questions "of program balance and proper management" for the COV, rather than having the committee answer standard questions as had been the case previously. The changes in the oversight process coincided with and were explicitly related to the establishment of the Office of the Inspector-General at the NSF.

There is some literature that ignores the 1977 plan or at least implicitly rejects this oversight as ineffective and sees the establishment of the COVs as a completely new process. See for example, HIGH TECHNOLOGY LAW JOURNAL 1 (1994):
"The audit idea surfaced during congressional hearings into alleged bias at NSF conducted during the mid-1970s. Although an extensive report by the subcommittee recommended that NSF adopt an internal auditing program, little came of the recommendation for many years. In 1989, NSF implemented a version of the audit idea with its 'Committee of Visitors' program under which each Directorate must appoint a committee of outsiders every three years to review the peer review process in operation."
However, the minutes of the NSB meetings clearly show that the NSB and the NSF saw the 1989 process as a tweaking of the older process established in 1977.

Legislative Branch concerns about Peer Review

Since the mid-1970s, Congress has periodically looked at NSF's merit review process, concerned about the integrity of that process. As described above, what became the COV mechanism was introduced to respond to this. NSF has been successful in addressing such concerns by emphasizing the external oversight provided by visiting committees.

In July 1975, NSF's process for determining how research funds should be awarded was the subject of six days of oversight hearings.[2] Several factors prompted this Congressional examination of NSF's merit review process. Concern about the content (or at least the titles) of some NSF awards had prompted an amendment to the 1975 NSF authorization bill that would have required that NSF monthly send a list of proposed grants to Congress for its review. Congress would then have the option of blocking any award by passing a resolution in either the House or Senate within 30 days. This amendment passed the House but was removed from the bill during conference. Instead, the House Subcommittee on Science, Research, and Technology undertook to hold hearings on NSF's merit review process. Another concern was that increased competition for NSF funds (a falling success rate) might lead to more complaints about how the merit review process operated. One Congressman at the hearings described NSF's peer review system thus: "It is an incestuous 'buddy system' that frequently stifles new ideas and scientific breakthroughs, while carving up the multimillion dollar Federal research and education pie in a monopoly game of grantsmanship." Seven "well-qualified scientists," including two members of an NSF Advisory Committee, were among witnesses who criticized NSF's merit review process. In its findings and recommendations, the Subcommittee generally supported the use of peer review as part of NSF's

[2] J.W. Symington and T.R. Kramer (1977). Does Peer Review Work? American Scientist, **65**, 17-20.

evaluation of proposals[3] but found that, "Certain problems exist with the Foundation's peer review evaluation processes and related operations," and recommended that, "Some corrective actions should be taken immediately and certain proposals for substantial changes should be thoroughly investigated." One of these recommended corrective actions was that NSF should conduct random audits of the decision processes used for individual grants. In response, NSF established both an internal Office of Audit and Oversight and a system of audit by external committees of scientific experts.

A 1975 GAO review of NSF's implementation of the merit review process identified a number of management deficiencies.[4] In response, NSF made a number of procedural changes including instituting internal "action review boards" to perform quality control checks of the merit review process leading to award and decline actions. This role is very similar to the quality control function now performed by COVs. A subsequent GAO review found that these were not fully successful. They failed, in some cases, to ensure that the rationale for program recommendations was clearly documented or that programs' review analyses addressed review comments that were adverse to the recommendation. These types of findings can still be seen in some COV reports suggesting that, without periodic external oversight, in a system as large as NSF's, persistent exceptions to the overall high quality of the merit review process may develop over time.

Congress recommended and NSF established an internal Office of Audit and Oversight to evaluate the adequacy of documentation and compliance with procedures. In November 1978, the Comptroller-General issued a report of another GAO study[5] of accountability in NSF's review process that it had conducted at the request of the Chair of the House Committee on Science and Technology. That report found that there had been improvement in the way NSF conducted its merit review process as a result of actions taken by NSF since the 1975 House hearings but was concerned that adequate justification for the selection of reviewers and program recommendations as well as adequate analysis of adverse comments in reviews was lacking.

NSF was able to counter the criticisms advanced in the 1978 GAO report by pointing to the role of what we now call COVs in providing a check on the quality of NSF's merit review process. NSF pointed out that thoroughly describing the expertise of each reviewer and justifying their selection in each proposal jacket would be an extraordinary burden. Instead it emphasized NSF's system of "external peer oversight" in which "members of our advisory committees periodically examine the operation of each program, including a sample of the files on proposals. Among the matters on which these groups comment are the selection of reviewers and the appropriateness and adequacy of the reviews." NSF also noted that some of the adverse reviewer comments that GAO identified were likely to need less

[3] For example, "No method superior to peer review has been found for judging the scientific merit of basic research proposals and the scientific competence of proposers. … The National Science Foundation should continue to use some form of peer review. Congress should not require major changes at this time in the methods used by the Foundation for proposal evaluation." In "National Science Foundation Peer Review, Vol. I. A Report of the [House] Subcommittee on Science Research and Technology." 1976. U.S. G.P.O. 63-458.

[4] "Representation of Peer Review Comments for the National Science Foundation's Individual Science Instructional System Project." MWD-76-78, Jan. 12, 1976.

[5] "Accountability in the National Science Foundation's Review Process for Grant Awards Needs Strengthening." HRD-78-171. November 17, 1978.

program officer explanation when examined in context by technical experts. A typical COV is comprised of such experts.

In 1985, Congress was again concerned about the appropriateness and fairness of the peer-review-based systems of merit review used by NSF and NIH. The Ranking Minority Member of the Senate Committee on Appropriations requested a GAO study and, in 1987, GAO issued a report that, amongst other things, noted that NSF used a four-pronged system to ensure the fairness of its merit review process: (i) review of program officer recommendations, reviewer selection and written reviews by divisional management staff; (ii) internal oversight via review of random samples of awards by NSF's Office of Audit and Oversight; (iii) *programs are "comprehensively reviewed" every three years by "visiting committees" composed of external peers familiar with the field who make formal reports to the Director that are publicly available*; (iv) NSF's program evaluation staff run statistical tests to see whether the system "has been 'fair' to certain classes of applicants." In the light of this report, Congress' concern abated for a while.

In 1992, Congress stated that it was "troubled by the selection process that was used to select" 31 specific research awards funded by NSF and rescinded $2,000,000 of R&RA funds that would have been used for these awards. In the accompanying conference report, Congress said that, "Recent reports by the General Accounting Office and the Office of Technology Assessment have reflected general criticisms of the grant selection process and the conferees believe the NSF should take the necessary steps to address these complaints."[6]

In 1994, the GAO issued a report on the use of peer review at three research funding agencies, including NSF. The study looked at "issues related to fairness in the selection of reviewers, the conduct of reviews and the decision to award funds."[7] The study had been requested by the Senate Committee on Governmental Affairs. Once again, the study concluded that the peer review process "appeared to be working reasonably well," but with some caveats. NSF disagreed with some of the report's statements and described seven safeguards that the Foundation had built into the review system. Among these was, "Visiting committees of knowledgeable persons from the various clientele communities closely examine each program every three years for, among other things, fairness and balance in decisions."

Episodic Congressional questions about NSF's merit review process have continued up until the present day.

COVs, Evaluation, and Assessment

COVs form part of an ecosystem of mechanisms through which NSF units solicit and receive advice, retrospective analysis and forward-looking suggestions. Other parts of this ecosystem include the National Science Board, Advisory Committees, focused workshops and their associated reports and recommendations, reports from the President's Council of Advisors on Science and Technology, the

[6] Conference Report on H.R. 4990, RESCINDING CERTAIN BUDGET AUTHORITY, House of Representatives, May 20, 1992, p. H3640.

[7] "Peer Review: Reforms Needed to Ensure Fairness in Federal Agency Grant Selection." 1994. GAO PEMD-94-1.

National Research Council, National Academies' Boards, the National Science and Technology Council Subcommittees, Joint Consultative Groups with other countries, as well as various forms of outreach conducted by NSF staff.

COVs originally studied and assessed only the process by which the NSF selects the projects it supports. Thus, COVs originally focused on oversight of the merit review processes and the management of those processes by program staff. In response to the Government Performance and Results Act (GPRA), NSF expanded the scope of the COV activities to include not only the review process (Part A) but an evaluation of the quality of the results of NSF investments that appear over time (Part B). Subsequently, COVs were asked to comment on: (1) noteworthy achievements based on NSF awards in the portfolio under discussion; (2) ways in which funded projects have collectively affected progress toward NSF's mission and the strategic outcome goals of Discovery, Learning, and Research Infrastructure; and (3) expectations for future performance based on the current set of awards. In addition to using information about the award portfolio of the program under review and their own knowledge of their fields, COV members looked at research highlights prepared by NSF staff and PIs.

In FY2008, the Advisory Committee for GPRA Performance Assessment (AC-GPA) concluded that, "Part B (Research and Education Outcomes) is not very informative and provides little, in fact far less, outcome information than the Committee receives in the performance highlights. The Committee recommended that Part B of the COV reports should be either enhanced or eliminated." Beginning in FY 2011, this evaluation and assessment component of the COV charge was dropped.