



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

116680

PROGRAM ANALYSIS  
DIVISION

June 25, 1981

B-201859



116680

Dr. Francis S. Johnson  
Assistant Director  
Directorate for Astronomical,  
Atmospheric, Earth and Ocean Sciences  
National Science Foundation

Dear Dr. Johnson:

Subject: National Research Centers Supported by NSF  
(PAD-81-79)

As you know, we presented the results of our review of NSF's oversight of the six national research centers under its sponsorship at a briefing for NSF officials on May 20, 1981. This letter summarizes our observations and proposals and the actions NSF plans in response to our review. (NSF's response to our briefing is included here as enclosure I.)

Our objective was to assess the effectiveness of NSF's oversight of the five national astronomy observatories and the National Center for Atmospheric Research (NCAR). The method we used to accomplish this objective was to evaluate the Foundation's oversight policies, procedures and practices and the organization and management of the centers. We did not evaluate the quality of the scientific research conducted at the centers. We reviewed documents and interviewed officials at NSF headquarters, the National Radio Astronomy Observatory's (NRAO) facilities in Charlottesville, Virginia, and Green Bank, West Virginia, the Kitt Peak National Observatory (KPNO) in Tucson, Arizona, and NCAR in Boulder, Colorado. We did not visit the National Astronomy and Ionosphere Center (NAIC) or the Cerro Tololo Inter American Observatory (CTIO) because of the expense of working in Puerto Rico and Chile, nor did we visit the Sacramento Peak Observatory (SPO) because we judged its budget (estimated to be about \$1.8 million in FY 1981) to be too small to warrant inclusion in our review. However, we believe the work locations chosen were sufficient to assess NSF's oversight of the centers.

(920866)

6/29/81

### OVERSIGHT AND ACCOUNTABILITY

NSF should improve its policies and guidelines for administering and overseeing the research centers. Despite recommendations made by GAO as early as 1967, the Foundation's Office of Audit and Oversight does not perform periodic reviews of the centers' organization and management, nor does it adequately monitor NSF's internal oversight. NSF Circular 117, "Guidelines for Administration of the National Research Centers," has not been updated since May 1974, and needs to be revised to provide clear lines of authority and responsibility. Although Circular 38, which addresses contracting, does contain performance measures (such as completion dates and final products), it is inadequate for long-term management contracts because it does not specify relevant evaluation criteria. In addition, NSF has not yet assigned responsibility for analyzing contractors' financial reports to identify variations between their budgets and actual expenditures.

The need for stronger NSF oversight is demonstrated by some contractor actions that are questionable and others that are clearly improper. These actions range from the Association of Universities for Research in Astronomy (AURA) having provided support services to neighboring facilities without charge, to the University Corporation for Atmospheric Research (UCAR) having reprogrammed \$459,000 into the NCAR Director's reserve without NSF approval. During the course of our briefing, we proposed several ways NSF can improve oversight and eliminate improper activities. NSF agreed to adopt all our proposals except two that concern AURA's free support services and free meals for its KPNO and CTIO employees. We suggested specific actions on these two, and NSF agreed to study these situations to make certain that charging for meals and support services would not negatively affect the centers involved. NSF also agreed to our proposal that its audit office perform organization and management reviews of the centers but stated that GAO may have overlooked or misjudged the full extent of the present review system. We are aware of each of the components of the current system listed by NSF and have reviewed each one carefully.

### KEEPING THE CONGRESS FULLY INFORMED

NSF has not fully informed the Congress of the size and scope of NCAR's operations. Reimbursable work, which comprises almost one quarter of NCAR's budget, is not reported. In addition, NSF's reporting of its astronomy support is misleading because funds provided for the operation of major university observatories are included with grants and therefore not reported as facilities support. NSF agreed to implement our proposal to provide the Congress with better information for decisionmaking.

CONSOLIDATING ASTRONOMY SUPPORT

Although the availability of highly skilled engineers, computer specialists, and technicians is decreasing, the astronomy centers maintain several geographically dispersed and redundant research support groups. Increasingly complex technical problems require the establishment of a "critical mass" of highly skilled scientific, technical, and administrative personnel whose talents can be pooled. NSF has not analyzed the potential savings that could be gained from consolidating the KPNO/CTIO or NRAO support groups. In response to our proposals, NSF stated that it will determine the most cost effective options for consolidating these various groups and will make the organizational changes needed to improve instrumentation support and reduce costs.

REDUCING GREEN BANK EXPENDITURES

NSF has not resolved whether to replace or shut down the older, costly to operate telescopes at NRAO's Green Bank, West Virginia observatory. The 140 foot telescope may be at or near the end of its useful life. In addition, the staffing level for operating and maintaining the Green Bank facility is too high for current and projected observation requirements. NSF agreed to implement our proposals for improving the cost effectiveness of this observatory.

ASSESSING OPPORTUNITIES FOR COLLECTING  
USER FEES AT ALL OF THE NATIONAL CENTERS

Only one of the six national centers, NCAR, collects fees from users of its facilities. NSF has not evaluated the applicability of these charges to the other centers. While we recognize that there are differences between NCAR and the astronomy observatories, there are also many similarities which suggest that user charges might be appropriate for the other centers. These similarities include Federal ownership, NSF sponsorship, a common mission to provide basic research facilities, and similar scientific user communities. We proposed that NSF evaluate the appropriateness of user charges for the other centers because such charges have the potential for promoting economy and efficiency. NSF agreed to develop criteria for determining the applicability of user fees at the astronomy observatories. In further discussions, NSF officials stated that it will be at least a year before they can begin to develop these criteria because of the need to first assess the evolving relationship between UCAR, NCAR, and NSF. We suggest that NSF begin its study now so that an appropriate and consistent user charge policy may be implemented as soon as possible.

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We appreciate the cooperation NSF gave us during our study. We ask that you keep us informed of the actions NSF takes regarding the points discussed in this report because we plan to follow NSF's progress in these areas. Copies of this letter are also being sent to Dr. Donald N. Langenberg, Deputy Director, NSF; Dr. Jerome Fregeau, Director, Office of Audit and Oversight, NSF; Mr. Thomas Ubois, Assistant Director, Directorate for Administration, NSF; and Mr. Gaylord L. Ellis, Director, Division of Grants and Contracts, NSF. If you have questions or wish to discuss these matters, please call Jo Ann Samuels on (202) 357-7870.

Sincerely,



Osmund T. Fundingsland  
Associate Director

Enclosure

ENCLOSURE I

ENCLOSURE I  
UNITED STATES GOVERNMENT

DATE: JUN - 8 1981

# memorandum

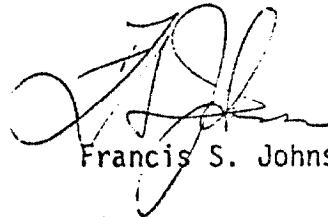
TO: AD/AAEO

SUBJECT: AAE0 Response to GAO Report on AST/ATM Centers

TO: GAO

Attached is the AAE0 response to your report on the AST/ATM Centers.

If you have any further questions, please contact Dr. Bridgewater,  
DAD/AAEO, on 357-7898.



Francis S. Johnson

Attachment

cc: Dr. Fregeau, OAO, Room 1242  
Mr. Franko, DGC, Chief of Research Centers  
AD/AAEO  
DAD/AAEO Chron  
Ms. Montgomery  
Ms. Onestak  
Ms. Hamilton  
Dr. Bierly, ATM, DD  
Dr. Tesi, Section Head, Centers/ATM  
Dr. Howard, AST, DD  
Section Head, Centers/AST  
Ms. Rison, AO/ATM  
Ms. Harrison, AA/AST



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5010-112

3 JUNE 1981

RECOMMENDATION - Revise NSF Circulars 117 and 38 to clarify the assignment of oversight authority and responsibility and establish performance evaluation criteria.

NSF Circulars 117 and 38 will be revised.

RECOMMENDATION - Improve financial reporting requirements and assign responsibility for financial analyses.

The opportunity for improvement of the NCAR reporting system was recognized several months ago. A concept for revamping the system was discussed with NCAR and agreed on in principle. A study to implement this concept was initiated several months ago. It is scheduled for completion next July 1981. The concept includes fewer reports, more concise data, maximum utilization of reports developed by NCAR for NCAR management, and timely imputs based on utilization of the NCAR administrative computer.

OAO will undertake a study of financial requirements and the relative roles of DFA, DGC, the science divisions and others using the contractor financial reports.

RECOMMENDATION - Perform periodic organization and management review.

OAO will work with AD/AEAO and the Director's Office to see how the present organization and management reviews might be modified to address this recommendation. It is noted that the full extent of the present review system, with major components outlined below, may have been overlooked or misjudged by GAO. It consists of, but is not limited to:

1. Divisional reviews of the annual Visiting Committee and SPEC. Reviews at each Center, plus the comments of the Directors, Center management and the Division (for the AST Centers). These are presented to the National Science Board annually.
2. Periodic visits of the NSB to the Centers and ad hoc visits of individual NSB members to the Centers.
3. Annual presentations of the Center Directors to the Director, NSF.
4. Attendance of Division staff members at meetings of the Centers' management/advisory boards/users' committees.
5. Written justifications for contract renewal at the end of each contract period.

The development of the "single audit" concept, permits the CPA firm for the National Center to perform, under contract to NSF, many of the routine regular audit functions at the Centers. The contract for such work at the AURA Centers will be made in FY81 and for UCAR (and possibly AUI) in FY82. This will free up some of the time of the small NSF Audit Office which will be used to make special organization and management reviews of the National Centers.

RECOMMENDATION - Evaluate UCAR's use of contract funds for corporate expenses and require UCAR to discontinue the improper use of funds.

UCAR use of contract funds for UCAR corporate expenses will be reviewed and discussed with the contractor. Prompt action will be taken to discontinue any improper practices that might exist. The existing contract between NSF and UCAR is based on a cost plus fixed fee arrangement. UCAR has proposed to NSF to change the fixed fee to an overhead account. The new system will afford audit verification of UCAR financial transactions.

RECOMMENDATION - Enforce the requirement for prior NSF approval for reprogramming amounts greater than \$50,000 into the NCAR Director's reserve account.

Improved oversight of the centers, and financial analysis of NCAR reports will assist in promptly identifying this and other types of problems that might exist with NCAR's financial management. The specific reprogramming action referred to in your report will be discussed with the NCAR management with the goal of rectifying the situation and clarifying any misunderstanding in the interpretation of the contract clause concerning reprogramming.

RECOMMENDATION - Evaluate the appropriateness of maintaining rental units in Tucson.

AST will undertake to determine the rationale for maintaining rental units in Tucson (who uses them, for how long, at what cost, cost of maintaining the operation at KPNO, etc.). The results of our inquiry will be made available to AD/AAEO, OAO and others, as appropriate in order to determine what action, if any, is then required. In general AST believes that the study should take the principle of "minimum cost to the government" strongly into account, while properly factoring in complaint levels from the private sector.

RECOMMENDATION - Require AURA to charge for support services and meals for KPNO and CTIO employees.

AST will ascertain what support services are made available to non-KPNO users on Kitt Peak, the extent to which these services are paid for or the prior agreements that have been made for their payment. AST will further ascertain the terms and conditions under which meals are charged on the KPNO and CTIO observing sites for their employees and for other visitors. A study of the replies to our inquiries will be made by AST and by such other offices as AD/AAEO and OAO may suggest in order to determine what further requirements NSF should make of both KPNO and CTIO. In general we believe that support services should be paid for and meals should be charged unless such charges would require other changes that would be deleterious or cumbersome to the operation.

RECOMMENDATION - To facilitate congressional oversight NSF should report to the Congress reimbursable work performed by the centers and total expenditures for university astronomy facilities.

In its annual budget to the Congress, NSF will include in the AST and ATM budget writeups the extent of each Center's reimburseable work. AST will include in its description of the IDA program the extent of funding for its approximately five large univeristy grantees.

RECOMMENDATION - NSF should, in cooperation with the astronomy contractors, thoroughly analyze and implement the organizational changes needed to realize improved instrumentation support and cost savings.

AST will, in cooperation with the astronomy centers' contractors, thoroughly analyze and implement the organizational changes needed to realize improved instrumentation support and cost savings. AST is already succeeding in affecting a consolidation of the program plans and long range plans of CTIO and KPNO. Beginning in FY 1982 both observatories will operate on a combined budget. Contract amendments have been made to affect transfers between the two observatories. AURA is investigating the hiring of a senior person to decide on scientific and budgetary priorities of the centers they manage. AST will request an analysis from NRAO to address the development work done by technical staff now being carried out at their major sites and we will decide on the appropriateness of the division of labor after their reply has been received.

RECOMMENDATION - Perform cost-benefit analyses to determine the viability of the older telescopes;

Determine the optimum level of Green Bank support staff; and

Eliminate excess and unnecessary support services and functions.

AST will request NRAO to perform a cost-benefit analysis to determine the viability of the 140 ft. and 300 ft. telescopes. We will ask them to do a life-cycle costing from now to the estimated end of the lifetimes of these two instruments (with lifetimes not to exceed 25 years) to determine if the sum of present operating cost would exceed the cost of replacement plus lifetime operating cost of the replacement. AST in cooperation with NRAO will determine optimum levels for staffing and support services. We, too, desire to see a plan to eliminate excess and unnecessary support services and functions at Green Bank.

RECOMMENDATION - NSF should evaluate the applicability of user fees to its national centers in accordance with the requirements of the user charge statute and OMB Circular A-25, and implement a consistent user charge policy for the centers.

AST and ATM will work with AD/AEAO to develop criteria for determining the applicability of user fees at the AEAO facilities.