

~~11274~~

REPORT BY THE

110506

Comptroller General

OF THE UNITED STATES

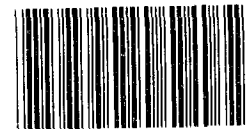
RESTRICTED — Not to be released outside the General Accounting Office except on the basis of specific approval by the Office of Congressional Relations.

Interagency Laboratory Use: Current Practices And Recurring Problems

RELEASED

Obtaining services from laboratories in another Federal agency is one of many types of interagency cooperation in research and development. Interagency laboratory use is one means to more efficiently use the vast and varied research and development resources of the Federal Government.

This report explores the extent and types of interagency laboratory use; scrutinizes the advantages, as well as constraints, and management problems associated with interagency laboratory work; and suggests approaches to congressional oversight of the area.



110506



506433
110506



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-58911

The Honorable John^{H.} Glenn
Chairman, Subcommittee on Energy, Nuclear
Proliferation and Federal Services
Committee on Governmental Affairs
United States Senate

SEN 06608

Dear Mr. Chairman:

This is a report on our review of contracting between Federal agencies for laboratory research and development tasks, in response to your April 28, 1978, request and subsequent discussions with your office. We examined (1) the extent and types of interagency laboratory use, (2) the advantages of such arrangements, and (3) the constraints and management problems which accompany interagency work. We visited 7 Federal agencies and 13 laboratories with differing research and development capabilities and needs. Also, we interviewed agency managers as well as laboratory directors and research personnel. (See p. 4.)

Appendix I contains a summary of our work and suggests specific topics which could be addressed in the course of congressional oversight. (See pp. 18 and 19.) Appendix II identifies past studies and congressional hearings which have treated issues surrounding interagency laboratory use. (See pp. 20 and 21.) Appendix III lists the agencies and laboratories visited for this study. (See p. 22.) Appendix IV contains an exchange of letters between GAO and the Department of Defense (DOD) commenting on problems of interpreting and implementing DOD's policy on nondefense work for other Federal agencies in its laboratories. (See pp. 23 to 27.)

This report covers only one aspect of interagency cooperation for research and development--contracting between agencies for laboratory work as it is conducted within the present system of agency-controlled laboratories. Whether a restructured Federal laboratory system would be more responsive to national needs is beyond the scope of this study.

While there are many types of cooperation in research and development, interagency laboratory use is one effective means of avoiding duplicative efforts and efficiently using costly Federal facilities and skilled technical personnel. However, there is no Government-wide policy or coordinating mechanism which specifically addresses contracting by one Federal agency with the laboratories of another. (See pp. 5 to 7.) Rather, the missions, policies, practices, and capabilities of each agency require, encourage, or limit the nature and extent of interagency laboratory use.

Substantial amounts of interagency work occur for a number of reasons. It offers many advantages, such as supporting mission requirements, redirecting laboratory expertise, benefiting researchers, making available unique capabilities, providing impartial technical advice, and making administrative arrangements simpler. (See pp. 10 to 13.)

Nonetheless, some constraints and management problems associated with interagency work may limit or make it difficult in practice. Agency and laboratory officials are concerned that work undertaken relates closely to their agencies' missions. Many perceive that personnel ceilings prevent or limit them from providing services to other agencies. Agencies and laboratories conducting work for others can experience resource control and planning difficulties. Agencies attempting to share their research resources sometimes encounter problems reconciling their differing objectives and approaches. (See pp. 14 to 18.)

This
Our review did not show that any of the problems present insurmountable obstacles to interagency work. Neither did it disclose any Government-wide problem with the ability of agencies to have research performed at other agencies' laboratories, indicating that, overall, cross-agency research needs can be satisfactorily handled. Nevertheless, the problems and constraints require continuous and aggressive attention by agency managers.

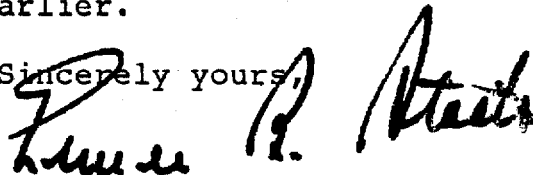
Errors of omission--as opposed to commission--are particularly difficult to identify; therefore, despite the absence of evidenced significant Government-wide problems affecting interagency laboratory use, we are reluctant to conclude that there is no room for improvement in laboratory operations. Thus, although we do not see a pressing need for new Government-wide policies or mechanisms to regulate or promote interdepartmental laboratory use, we believe there is a need for continuing congressional oversight of these activities. Such oversight affords opportunities for monitoring,

controlling, or stimulating interagency laboratory use. At the conclusion of appendix I, we offer some specific approaches to congressional oversight of this aspect of laboratory use. (See p. 19.)

In a separate letter to DOD, we asked it to " * * * clarify and renew its policy for non-defense work in the laboratories." (See pp. 23 to 25.) We were concerned that accessibility at DOD laboratories for appropriate interagency tasks may be limited by improper interpretation and implementation of DOD's policy regarding laboratory work for other agencies. In its response, DOD generally agreed with our findings, but indicated that scarce manpower authorizations limit the amount of nondefense work the laboratories perform. (See pp. 26 and 27.) We recognize these limitations. However, we think that this makes it doubly important for DOD to provide clear guidance to its laboratories on the use of their resources to respond to national needs.

As suggested by your office, we did not obtain formal agency comments on the results of our study. However, we discussed the above matters with responsible officials and considered their comments where appropriate. No further distribution of this letter will be made for 30 days unless you announce its contents earlier.

Sincerely yours,



Comptroller General
of the United States

FINDINGS, CONCLUSIONS, AND APPROACHESTO CONGRESSIONAL OVERSIGHT

The Chairman, Subcommittee on Energy, Nuclear Proliferation and Federal Services, Senate Committee on Governmental Affairs, on April 28, 1978, asked us to examine "* * * contracting by one Federal Agency with the in-house laboratories of another." ^{1/} These interagency or cross-agency arrangements involve the transfer of funds from one agency or department to a laboratory in another Federal entity for specified research and development services. More specifically, he asked us to explore the extent of this activity, the environment in which it takes place, and any administrative or policy limitations which might inhibit interagency laboratory use.

BACKGROUND

Full and efficient use of the Federal Government's vast research and development capabilities is a constant quest. Interagency laboratory use is one effective means of avoiding duplicative efforts and efficiently using costly Federal facilities and skilled technical personnel.

Both the legislative and the executive branches have periodically examined how agencies share their research resources. The House Science and Astronautics Committee held hearings in 1968 on "Utilization of Federal Laboratories." Testimony on cross-agency sharing of laboratory resources was gathered from a dozen Federal research and development officials and published together with a collection of relevant documents.

Between 1971 and 1974, the Federal Council for Science and Technology proposed a "Policy for Expanded Interagency Cooperation in Use of Federal Laboratories." The Council asked the President's Science Advisor and the Office of Management and Budget to endorse and promulgate the policy, but no action was taken.

^{1/}The term "contract," when used in regard to arrangements between Federal agencies, retains its general meaning as a binding agreement between two parties. It should not be confused with contracts and associated regulations used by the Government to obtain goods and services from external sources.

In December 1972, the Commission on Government Procurement reported to the Congress several examples of inter-agency research and development cooperation and recommended that Federal agencies "* * * whenever possible be responsive to the needs of other Federal agencies and activities." These varied examinations of cross-agency laboratory use, along with other studies cited in appendix II, illustrate the interest in the topic over the years. They also provided useful perspectives in preparing this report.

Scope of Federal research and development investment

In fiscal year 1978, 37 Federal agencies obligated an estimated \$26 billion on research and development activities. Federal support accounted for about 50 percent of all research and development spending in the United States. Ten agencies obligated most of the Federal research and development funds, with the top 6 controlling 93 percent of the total. The President's fiscal year 1980 budget requests \$30.6 billion for Federal research and development activities.

Federal agencies employ a variety of institutions to do research and development work. Industrial firms receive over half of Federal research and development expenditures; mostly to develop new technologies, but also to manage some Government research facilities. Universities and colleges receive about 17 percent of the Federal research and development dollar. They also manage a few Government facilities, but most of the funds go to the campuses for basic and applied research. The Federal Government itself, using facilities within its departments and agencies, accounts for about 25 percent of the total.

A recent House Appropriations Committee Surveys and Investigations Staff Report estimated that the Federal Government has 779 "Federal laboratories" employing over 240,000 people, of which the Government operated 707 laboratories employing over 160,000 people. The laboratories range from small units with less than 10 employees to multipurpose complexes operated by over 2,000 people. Although not all agencies submitted complete data, the report found that the 1977 estimated current investment value of Federal laboratories exceeds \$18 billion.

Function and tasks of
Federal laboratories

Federal laboratories all have the same basic function, although the tasks they perform cover a wide range of research activities. The function of Government laboratories, whether operated by Government employees or contractor personnel, is to provide scientific and technical services to their parent agency. All Federal laboratories share a common attribute: they report and are responsible to a specific agency which provides direction and allocates resources. The laboratories' roles and tasks originate primarily from the history, past practices, and missions of their parent agency, rather than from some national laboratory management scheme.

The tasks of the Federal laboratories cover almost all activities constituting research and development. In 1962 the "Report to the President on Government Contracting for Research and Development," (also known as the Bell Report) listed the activities included in research and development. All the Federal laboratories perform some combination of the following activities.

- Fundamental research.
- Supporting research or exploratory development.
- Feasibility studies, operations analysis, and technical advice.
- Development and engineering of products, processes, or systems.
- Test and evaluation activities.

The Bell Report also noted that the laboratories can provide "technical management personnel" for their parent agency.

Like the agency, the laboratory may use a number of sources to get its work done. In addition to its own resources, the laboratory may contract for research and development tasks with industry, universities, or other institutions, including laboratories in other Government agencies.

Scope of review

Our review included an examination of the extent and types of interagency laboratory use, reasons for and advantages of such arrangements, and issues and management problems which accompany these arrangements. The review is based on work at components of seven Federal entities.

- Department of Commerce.
- Department of Defense.
- Department of Energy (DOE).
- Department of Housing and Urban Development (HUD).
- National Aeronautics and Space Administration (NASA).
- Nuclear Regulatory Commission (NRC).
- U.S. Postal Service.

They represent a wide range of agencies with differing research and development capabilities and needs, and account for almost 80 percent of total Federal funds for research, development, and related facilities. We visited 13 laboratories within these entities. (See app. III for a list of locations visited.)

We requested each agency to provide financial data for work performed for them by laboratories in other Federal agencies and work their laboratories do for other agencies. Interviews were conducted with headquarters research and development program officials, laboratory directors, and laboratory program managers and researchers. Also, we explored the nature of work being performed, the motivations for cross-agency work, and the views of agency and laboratory personnel on problems and limitations surrounding inter-agency work. In addition, we examined agency policies and overall Federal policies which influence or regulate inter-agency work. Finally, we discussed these policies with officials of the Office of Management and Budget (OMB) and the Office of Science and Technology Policy.

A variety of forms of interagency research and development cooperation, other than interagency contracting, are beyond the scope of this review and were not included. These include:

- Jointly planned, separately funded research programs, such as those in climate and earthquake research.
- The extensive informal cooperation among agencies, such as the multitude of informal connections between NASA and DOD.
- Collocation of facilities and informal joint-facility use.

Although these types of cooperation were not the subject of this review, they also contribute to the effective use of research and development resources.

LAW AND POLICY AFFECTING
INTERAGENCY LABORATORY USE

There is no overall legislation which specifically addresses contracting by one Federal agency with the laboratories of another. Nor is there any Government-wide policy or mechanism which guides or coordinates such sharing of laboratory resources. Rather, for the agencies we reviewed, legislation applicable to specific agencies, coupled with agencies' internal policies and regulations, requires, encourages, or limits cross-agency laboratory work.

The general legal sanction for interagency work is the Economy Act of 1932, as amended (31 U.S.C. 686 (1976)), which provides that:

"Any executive department * * * may place orders with any other such department * * * for materials, supplies, equipment, work, or services, of any kind that such requisitioned Federal agency may be in a position to supply or equipped to render * * *."

The law also directs the use of competitive bids if the work can be "* * * as conveniently or more cheaply * * *" performed by a non-Government source.

As mentioned earlier, the Committee on Federal Laboratories of the Federal Council for Science and Technology, on a number of occasions between 1971 and 1974, proposed a policy for expanded interagency cooperation in use of Federal laboratories which was never promulgated. The policy recommended agency coordinating mechanisms and relief from personnel ceilings for interagency work. In 1976 the Committee and the Council were abolished.

The Federal Coordinating Council for Science, Engineering, and Technology replaced the former Council in 1976, but no committee on laboratories has been formed. Also, the new Council has not taken up laboratory use questions. The law creating the Council (National Science and Technology Policy, Organization, and Priorities Act of 1976, Public Law 94-282), directs it to:

"* * * recommend policies and other measures designed to * * * achieve more effective utilization of the scientific, engineering, and technological resources and facilities of Federal agencies, including the elimination of unwarranted duplication * * *."

The act also mentions shared use of costly facilities, but it does not directly address contracting between agencies for laboratory work.

Specific legislative mandates prescribe or encourage interagency laboratory use for some agencies. The legislation creating the National Bureau of Standards authorizes it to provide scientific services to other agencies. The Bureau is also required by other laws to provide support in particular areas, such as resource conservation and product safety. HUD is directed by its organic act to "* * * utilize to the fullest extent feasible the available facilities of other Federal departments and agencies." NRC is required to use the other agencies' facilities rather than build its own laboratories.

In one case, an executive branch directive prescribes interagency use of a specific agency's laboratories. The National Oceanic and Atmospheric Administration (NOAA), as a result of OMB Circular A-62, is responsible for providing and coordinating certain meteorological services for other Federal agencies.

Some legislation and agency policies limit or discourage interagency laboratory use. Although not specifically addressing interagency work, the 1970 and 1971 Armed Forces Appropriation Authorization Acts (Public Laws 91-121 and 91-441) limited the use of funds to those projects related to a military function or operation. (These provisions have become known as the Mansfield Amendments.) The acts placed a premium on work directly related to the defense mission, and appear to have limited the flexibility of the DOD laboratories in responding to tasks outside their immediate mission.

In 1972 DOD encouraged its laboratories to participate in work for civilian agencies. But then, in 1974, the laboratories were instructed to limit their nondefense work to 3 percent of professional staff years. NASA has also placed some staff limitations on work for another agency. Work for DOE at the NASA Lewis Research Center is not to exceed the equivalent of 350 staff-years annually.

Guidelines to accept work from other agencies have been developed by some agencies for their laboratories to follow. These guidelines, which vary in scope and detail from agency to agency, may be extensions of general Government policies, such as directives to avoid tasks more appropriate for the private sector. Or the guidelines may be particular to the agency, such as DOD's policy prohibiting the addition of new staff or facilities to accommodate nondefense work for other agencies.

We found no specific or general policies which restrain agencies from seeking the assistance of another agency's laboratories. We reviewed Government policy on contracting, including the recently revised OMB Circular A-76. According to agency officials, although adherence may require additional paperwork, the circular does not present significant obstacles to interagency laboratory use. Also, although every agency wants its own facilities to be used first, there are no agency policies specifically preventing contracting for work with laboratories in other agencies.

No formal mechanism exists for coordinating interagency laboratory use. One organization, the Federal Laboratory Consortium, brings together representatives of nearly 180 laboratories in an informal network. The Consortium's primary purpose is to foster the transfer of technology developed in Federal laboratories to State and local governments for solving their technical problems. In its initial years, the Consortium attempted to foster interagency laboratory work, but currently, it does not play a role in major cooperative efforts between Federal agencies. Furthermore, it does not have a statutory base or formal sanction to coordinate interagency work among laboratories.

EXTENT AND NATURE OF INTERAGENCY LABORATORY USE

Extent not readily measured

Our efforts to develop a dollar measure of interagency laboratory use were hampered by the lack of uniform data

across the Government. The National Science Foundation gathers and reports data on the research and development performers which receive funds from each agency. But, the Foundation's data does not differentiate between research and development funds spent in-house by the individual agencies and those funds sent to other agencies. Thus, these statistics show HUD obligating \$20 million intramurally in 1977, not revealing that almost \$19 million of those dollars were actually paid for work performed by other agencies for HUD.

Lacking a centralized data source, we asked the agencies we visited to provide financial data on the amount of research and development funding sent to other Federal agencies and the amount received from other agencies. Differences in agency accounting systems and other technical problems qualify the statistics on the following page as best estimates.

The statistics are a measure of contracting (transfer of funds) between agencies for research and development tasks and present an indicator of the scale of interagency work. As such, they include funds for interagency laboratory use, but also include some funds spent outside laboratories. For example, a portion of the funds transferred to NASA were then transferred to industrial contractors. Also, moneys transferred to HUD, which has no laboratories, were all placed on contract to the private sector. Some of the funds also represent social science research not performed in laboratories, such as transfers from HUD to the Census Bureau for housing surveys.

Nature of interagency laboratory work

Interagency laboratory work is not limited to any single type of research and development activity or characterized by any standard working relationship between agencies.

The services provided by laboratories on an interagency basis run the gamut of research and development activities, as identified earlier. (See page 3.) As noted, work for another agency may require a laboratory not only to perform in-house tasks, but also to award and/or manage industrial contracts.

The scope of interagency laboratory work also varies. A laboratory may be called upon to perform one-time specific tasks or two agencies may maintain long-term, semipermanent relationships for laboratory work.

Most interagency laboratory work is between agencies with mutual or similar technical interests and needs; for

Estimates of Interagency Transfers of Research
and Development Funds for Selected Agencies

Department or agency	Agency research and develop- ment budget (note a) FY 1978	Research and development funds sent to other Federal agencies (note b)		Research and development funds received from other Federal agencies (note b)	
		FY 1977	FY 1978	FY 1977	FY 1978
----- (000 omitted) -----					
Commerce:					
National Bureau of Standards	\$ 74,900	\$ 875	\$ 75	\$ 48,759	\$ 55,100
NOAA	162,800	(c)	4,290	(c)	33,935
National Tele- communications and Information Administration	2,600	120	138	9,269	7,468
DOD:					
Army	2,635,000	36,889	31,399	20,313	8,950
Air Force	4,579,200	5,192	5,484	55,987	67,607
Navy	4,117,500	18,080	17,216	8,583	9,130
Defense agencies	760,300	30,194	16,483	1,451	3,099
DOE	4,921,000	158,873	222,269	234,061	272,103
HUD	61,707	18,720	24,571	22,755	32,515
NASA	4,038,800	223,200	216,000	185,144	231,458
NRC	172,002	129,253	150,879	-	-
U.S. Postal Service	28,400	784	1,028	-	-

a/Agency totals derived from FY 1980 U.S. Budget, National Science Foundation, and agency data. Reported as obligations for operating and capital expenses.

b/Estimates for interagency transfers derived from budget documents, congressional reports, and agency data submitted to GAO. Commerce data includes transfers between internal components; Defense data does not include interservice transfers.

c/Not available.

example, DOD and NASA or DOE and NRC. A small portion of the work may not contribute directly to the agency's objectives, but may be performed as a service to another agency.

REASONS FOR INTERAGENCY LABORATORY WORK

Interagency laboratory work occurs for many reasons. As mentioned, much cross-agency work comes in response to legislative mandates and encouragements. Also noteworthy is the point made in the Bell Report and in the Report of the Commission on Government Procurement that tradition and past practice are important determinants in the choices agencies make of research and development performers. In the interagency context, this means an agency may use a particular laboratory because of satisfaction with past work and the existence of a familiar working relationship.

Our review confirmed the tradition and past practice point and revealed a number of additional reasons for interagency laboratory use, some applying to the laboratory which performs work for other agencies and others related to why agencies might seek assistance in another Government department. Although we isolate these reasons for discussion purposes, in practice they are interrelated.

Supports mission requirements

Mission requirements motivate much interagency laboratory work. For three of the components of the Department of Commerce--the National Bureau of Standards, the National Telecommunications and Information Administration, and the National Oceanic and Atmospheric Administration--work for other Government agencies is a crucial portion of their laboratories' missions. Work for other agencies is not only required, but also enhances the directly funded program of the laboratories by permitting them to acquire greater expertise and a wider range of work experiences. Through interagency work, NASA and DOD laboratories can more efficiently use their resources to achieve similar technical goals.

While the principle of mission relevance has sometimes been perceived as a barrier to interagency laboratory use, these examples demonstrate that work for others can also be a complementary, if not crucial, element of a laboratory's activities.

Mission requirements also make it necessary for agencies to seek work from laboratories in other departments.

Entities such as HUD and NRC do not have research facilities and must seek solutions to many technical problems from other agencies' facilities, in addition to private contractors.

Redirects laboratory expertise

At times, laboratories work for other agencies in response to shifts in agency or national priorities. Such shifts can leave a facility with fewer responsibilities and possible cuts in staff. To reduce the magnitude of personnel reductions or the loss of expertise in specific fields, a few large Federal laboratories have partially redirected their efforts to respond to other agencies' needs. In the sixties, for example, the Oak Ridge National Laboratory, then part of the Atomic Energy Commission, initiated research programs in desalination, civil defense, and biology under sponsorship from various agencies. ^{1/} A more recent example of diversification is NASA's Lewis Research Center, which has responded to decreased work on space projects and the emergence of new energy research needs by allowing approximately 10 percent of its allocated staff-years to be devoted to projects for DOE. The Naval Research Laboratory, in order to maintain staff in nuclear energy research fields not currently needed by the Navy, performs numerous projects for DOE and NRC.

Such redirections of major laboratories can provide rapid responses to emerging problems and help avoid the cost of developing new Federal capabilities. However, multiple funding sources can bring problems for long-term laboratory stability. Too much diversification could impair a laboratory's ability to fulfill its main purpose for its parent agency.

Benefits researchers

Work for other agencies often provides benefits not only to the laboratory as an organization, but also to the individual researchers. Some interagency projects are initiated by researchers and allow their work to continue or broaden in scope. Partial support from an outside agency can also lend prestige to work and offer useful advantages, such as increased travel funds.

^{1/}For a detailed account of the Oak Ridge experience, see Teich, Albert H. and Lambright, W. Henry, "The Redirection of a Large National Laboratory," Minerva, Volume XIV, No. 4, London, Winter 1976-77.

Provides unique capabilities

Interagency laboratory use provides access to unique research and development capabilities, such as the National Bureau of Standards facilities, NASA and DOD aeronautics testing devices, and DOE's nuclear power research equipment. We noted numerous cases of NASA and DOD using each other's facilities. Also, a facility at the Naval Research Laboratory offers unique irradiated materials testing services to both DOD and NRC. The use of another department's unique capabilities or experience may be on a long-term basis, such as NASA's and DOD's shared use of wind tunnels; or the sharing may be for one-time specific tasks, such as the Postal Service's employment of a Navy laboratory for a short-term project on a specific technological development. Agencies are generally aware of unique capabilities possessed by others, and numerous interagency committees attempt to coordinate development of new facilities in order to avoid duplication.

Provides impartial technical advice

Sometimes it is necessary to call on other Government facilities to assist in carrying out technical management functions. An agency may not have, or be able to permanently acquire, personnel to evaluate industrial contractor research and development proposals and resulting products. In such cases, the agency may seek help elsewhere in the Government. The Postal Service recently used personnel from a Navy laboratory and two Commerce Department laboratories to assist in early stages of its electronic message service research and development program. The three laboratories assisted in choosing the technical approach, selecting contractors, and evaluating contractor performance. This form of interagency cooperation helps agencies with limited technical capabilities to be "smart buyers" of new technology.

Simplifies administrative arrangements

The administrative arrangements for interagency laboratory work are easier to initiate and manage than other types of extramural arrangements, such as contracts with industrial firms. A number of officials said that once two agencies decide to cooperate, (1) arrangements for work require much less leadtime than contracts, (2) there is less paperwork and oversight for interagency work than for work performed by other contractors, and (3) it is easier to make adjustments in the content or scope of interagency projects as they progress.

Formal agreements between agencies and laboratories vary in detail; there is no single prescribed legal format. For large, multifaceted interagency research and development efforts, a memorandum of understanding is usually negotiated which assigns general responsibilities and establishes the management process for conduct of the work. Specific instruments, such as interagency agreements or task orders, are used to contract for actual projects. Typically, these include a description of the project; provisions for staffing and costs; and, sometimes, clauses on relations with private contractors and patent provisions. The departments and agencies have management instructions in various levels of detail which specify the information necessary for inclusion in agreements.

Interagency work is often initiated at the research level, and most of the laboratory directors we interviewed have the authority to enter into agreements with other agencies. The level at which agreements can be approved usually depends on the amount of money or staff involved. For example, Corps of Engineers laboratory directors can approve work requested by other agencies costing \$50,000 or less, and NOAA's Environmental Research Laboratories can approve up to \$150,000 or a 5-staff-year level of effort for outside agencies.

While many officials agreed on the ease and flexibility of the technical arrangements for interagency work, some concerns were expressed. They cited practices such as using a percentage of reimbursable money as a laboratory discretionary fund; using a Government laboratory due to the ease with which it can be arranged, rather than because it is the most appropriate performer considering cost and other factors; and transferring funds to other agencies at the end of fiscal years to disguise surpluses.

The scope of this study did not include a confirmation of these practices or a detailed examination of procedures used by agencies in placing work with other agencies' laboratories. Another recent GAO study addressed some of the problems related to the administrative arrangements for research between NRC and DOE. 1/ We believe that assuring the propriety of interagency arrangements is consistent with maintaining their flexibility and necessary to provide adequate accountability.

1/"NRC's Use of Consultants, Contractors, and the National Laboratories" (EMD-79-37, Mar. 7, 1979).

CONSTRAINTS AND MANAGEMENT PROBLEMS
ACCOMPANY INTERAGENCY WORK

Although interagency laboratory work occurs and offers many advantages, some constraints and associated management problems may limit or make the work difficult in practice. Agency and laboratory officials are concerned that work undertaken relates to their mission. Many perceive that personnel ceilings prevent or limit them from providing services to other Government entities. The agencies and laboratories which conduct work for others can experience resource control and planning difficulties. Also, agencies attempting to share their research resources can experience problems reconciling their objectives and approaches. Although we isolate these topics for discussion like the reasons for interagency work, in practice they are interrelated.

Relating work to agency mission

The mission of most Federal laboratories requires them to respond first and foremost to their parent agency. For some laboratories, such as those of the National Bureau of Standards, the mission requires extensive work for other departments. For other laboratories, whose missions are not closely related to those of other agencies, the accessibility of the laboratories' resources for application to other agency problems is limited. We found this to be true in DOD laboratories.

A number of factors account for the mission relevance concern and limits on accessibility of the DOD laboratories. Many DOD research and development officials feel that work for other agencies must also serve a direct defense need. Some feel that the DOD laboratories should do only defense work. This belief may be partially based on the residual effects of the 1970 and 1971 Armed Forces Appropriation Authorization Acts which limited the use of DOD funds to those projects which had potential military application. In effect, the acts encouraged DOD research managers to avoid any work which could not be easily related to the DOD mission. We were unable to clearly establish the specific impact of the acts on interagency work, since few DOD officials isolated them as barriers to cross-agency work.

The DOD laboratories are allowed to devote 3 percent of their staff to nondefense work requested by other agencies, but few have approached this limit. The total dollars for DOD interagency work is substantial--\$80 million. One DOD official said that the 3-percent limitation means that

the laboratories should do enough work for others so that it is visible, but not so much so that it interferes with defense work. A DOD laboratory director said that the low percentage permitted implied to him that DOD management discourages nonmission work, and also that the Congress and the public expect a DOD laboratory to do only defense work.

Such perceptions and concerns, coupled with a heavy workload for defense requirements and personnel reductions, limit interagency accessibility to DOD's vast and varied research and development facilities. We explored these problems in a 1972 report to the Congress. 1/ It appears that little progress has been made since that time.

Other laboratories and agencies share DOD's concern of closely relating their work to their mission. For example, even though NOAA provides substantial services to others, a NOAA management guideline states that reimbursable work for others will be accepted only if it does not adversely affect regular NOAA programs. Such instructions are common to many agencies; work for other agencies is relegated to a secondary position.

It is imperative that laboratories pursue their primary responsibilities. The ability to respond quickly and adequately to the parent agency is one of the primary rationales for having Government laboratories. However, in our opinion, attachment to a specific agency and fulfillment of a particular mission are not, in themselves, acceptable justifications for limiting the accessibility of Government laboratories for appropriate interagency tasks.

Working within personnel ceilings

Many laboratory and agency officials perceive personnel ceilings as an obstacle to increased interagency laboratory work. Some note that ceilings, in some cases combined with reductions of personnel, contribute to a situation of minimal flexibility in which parent agency work takes first priority and work for others is done only when there is a strong shared interest and available personnel. Another concern is that work for others could give the impression that a laboratory has unnecessary people and is eligible for cuts.

1/"Means for Increasing the Use of Defense Technology for Urgent Public Problems" (B-175132, Dec. 29, 1972).

Concern about the effect of personnel ceilings on the extent of interagency work is not new. The policies for interagency laboratory use proposed by the Federal Council for Science and Technology in the 1971-74 period included various suggestions for relief from ceilings. During the 1968 House Science and Astronautics Committee hearings on cross-agency laboratory use, DOD officials suggested removing ceilings for interagency work. Dr. Allan Astin, then Director of the National Bureau of Standards, and Chairman of the Federal Council for Science and Technology, Committee on Federal Laboratories, summarized the position of many laboratory administrators on the general issue of control over management decisions, including staffing.

"* * * to the maximum extent possible, laboratory directors should be given an overall allocation of resources with which to achieve a mutually understood set of program goals. Within this general framework, administrative and management decisions as to the proper mix of staff, supporting services, facilities, travel, et cetera should be left to the judgement of the laboratory director, who should be held subject to postaudit and fully accountable for the end results."

We regard personnel ceilings as "* * * at best, an inferior substitute for effective management." 1/ In our 1972 report on use of defense technology for public problems, we recognized the inhibiting effects of ceilings. 2/

We were unable to clearly establish whether removal or adjustment of personnel ceilings would contribute to a substantial increase in interagency laboratory use. A number of issues remain to be resolved, such as if ceilings were increased, should the performing or sponsoring agency carry the additions? Would alternative personnel management systems necessarily be more conducive to interagency work?

1/"Personnel Ceilings--A Barrier to Effective Manpower Management" (FPCD-76-88, June 2, 1977).

2/"Means for Increasing the Use of Defense Technology for Urgent Public Problems" (B-175132, Dec. 29, 1972).

Would other constraints, such as the mission relevance issue, discourage interagency work even without ceilings? Experiments with the removal of personnel ceilings 1/ have been too limited in scope and duration to provide reliable conclusions on its effects on interagency work. Finally, given the current emphasis on limiting Government activities through a variety of budgetary and management controls, in addition to personnel ceilings, we found it difficult to isolate the influence of personnel ceilings on interagency laboratory use.

Managing interagency laboratory work

Interagency laboratory work is accompanied by management problems. Planning and resource control is difficult, and agencies are forced to reconcile differing objectives and approaches. These problems may deter some interagency work and must be considered by laboratories or agencies attempting cross-agency work.

Laboratories which perform large amounts of work for other agencies may encounter special problems. Because they are not always involved in other agencies' planning, the laboratories can be subjected to unexpected fluctuations in funding, which may impede long-term planning. Such problems have prompted some laboratories to try to gain long-term commitments. The National Bureau of Standards, which receives almost half of its funding from other agencies, often must develop a fundamental basis of research and understanding to underlie the measurement standards requested by other mission agencies. The Bureau has sought to obtain funding for this development both through direct appropriations to support its mission and through long-term commitments from other agencies.

Interagency work can also bring facility planning problems. Some agencies will not add new facilities or equipment to support work for others. Also, sponsors of work in other agencies are not eager to provide funds for new facilities not under their control. After the former Atomic Energy Commission was divided into the NRC and the Energy Research and Development Administration (now DOE), the two entities experienced problems of joint facility planning, development,

1/"Project REFLEX (Resource Flexibility)--A Demonstration of Management Through Use of Fiscal Controls Without Personnel Ceilings" (B-165959, June 21, 1974).

and administration. ^{1/} Such problems forced the two agencies to devise formal procedures for planning and managing shared use of facilities.

Interagency laboratory use also requires agencies to reconcile differing objectives and approaches. For the last 3 years, NASA research centers have managed substantial research and development programs for DOE. DOE officials told us of the difficulties in convincing NASA research managers of the importance of examining the commercial feasibility of technologies at very early stages of development. These problems can be partially attributed to NASA's orientation towards direct Federal needs versus DOE's objective of stimulating private sector developments.

None of the management problems for interagency work present insurmountable obstacles. However, it is clear that efficient and effective interagency laboratory use requires a commitment of management time and resources, in some cases an extensive commitment. The current cooperative efforts among agencies demonstrate that the costs of such attention are commensurate with the benefits.

CONCLUSIONS

Interagency laboratory work is one means to efficiently and effectively use the Government's research and development resources. Together with other forms of cooperation, it is a necessary and appropriate instrument for reducing the costs and integrating the capabilities of those Federal agencies requiring scientific and technological support.

There is no Government-wide policy or coordinating mechanism which specifically addresses contracting by one Federal agency with the laboratories of another. Rather, the missions, policies, practices, and capabilities of each agency require, encourage, or limit the nature and extent of interagency laboratory use.

While interagency laboratory work occurs for a number of reasons and offers many advantages, concerns about the relevance of work to a laboratory's mission and limits on available personnel can restrict the type or extent of interagency laboratory use. Interagency work is also accompanied by its own management problems. However, our review did not

^{1/}"Poor Management of a Nuclear Light Water Reactor Safety Project" (EMD-76-4, Aug. 25, 1976) and "Development of Interagency Relationships in the Regulation of Nuclear Materials and Facilities." (RED-76-72, Mar. 10, 1976).

disclose any Government-wide problem with the ability of agencies to have research performed at other agencies' laboratories, indicating that, overall, cross-agency research needs can be satisfactorily handled.

Thus, there is no pressing need for new policies or mechanisms to regulate or promote interagency laboratory use. Nonetheless, interagency cooperation deserves continuing attention as one aspect of Federal laboratory use. Congressional oversight affords opportunities for monitoring, controlling, or stimulating interagency laboratory use. Oversight can be applied on an agency-by-agency basis or on a subject area basis.

Approaches to congressional oversight

Periodic authorization and appropriations hearings provide opportunities to examine individual agency policy and practices affecting interagency laboratory work. A variety of topics could be explored with both the science-oriented agencies and with those agencies with some technical needs, but limited capabilities. These topics include:

- Agency efforts to consider using existing Government facilities when seeking research and development performers.
- Agency practices which inhibit interagency work.
- Adequacy of management controls on interagency projects.
- Agency laboratories' ability to respond to emerging national needs.
- Impact of interagency efforts on the overall effectiveness and vitality of particular laboratories.

Legislative and oversight hearings concerning the Nation's science and technology policies and resources also provide opportunities to explore interdepartmental laboratory use. The topic could be raised in the periodic reviews of the activities of the Office of Science and Technology Policy or in examinations of how well the Federal Council for Science, Engineering, and Technology fulfills its legislated functions. The Congress could also review the Federal Laboratory Consortium's activities relating to interagency laboratory work.

Periodic congressional attention can help interagency laboratory use to continue to be an important instrument in efficiently deploying our scientific and technological capabilities for the solution of national problems.

PAST AND CURRENT STUDIES

- 1962 - Bureau of the Budget, "Report to the President on Government Contracting for Research and Development" (The Bell Report), U.S. Government Printing Office, Washington, D.C., May 1962.
- 1966 - Committee on Government Operations, Subcommittee on Research and Technical Programs, U.S. House of Representatives, 89th Congress, Second Session, "A Case Study of the Utilization of Federal Laboratory Resources," U.S. Government Printing Office, Washington, D.C., November 1966.
- 1968 - Committee on Science and Astronautics, Subcommittee on Science, Research, and Development, U.S. House of Representatives, 90th Congress, Second Session, "Utilization of Federal Laboratories" (Hearings), March, April 1968.
- 1972 - "Report of the Commission on Government Procurement, Volume II," Washington, D.C., December 1972.
- 1972 - U.S. General Accounting Office, "Means for Increasing the Use of Defense Technology for Urgent Public Programs" (B-175132, Dec. 29, 1972).
- 1973 - Arthur D. Little, Inc. "Intergovernmental Use of Federal R&D Centers and Laboratories," Washington, D.C., April 1973.
- 1974 - Federal Council for Science and Technology, Committee on Federal Laboratories, "Intergovernmental Use of Federal R&D Laboratories," March 1974.
- 1974 - Committee on Appropriations, Subcommittee on Agriculture-Environmental and Consumer Protection, U.S. House of Representatives, 93d Congress, Second Session, Investigative Report on "Utilization of Federal Laboratories," U.S. Government Printing Office, Washington, D.C., April 1974.
- 1976 - Committee on Science and Technology, Subcommittee on Domestic and International Scientific Planning and Analysis, U.S. House of Representatives, "Inter-agency Coordination of Federal Scientific Research and Development: The Federal Council for Science and Technology," 94th Congress, Second Session, July 1976.

- 1976 - Teich, Albert H. and Lambright, W. Henry, "The Redirection of a Large National Laboratory, "Minerva, Volume XIV, No. 4, London, Winter 1976-77.
- 1978 - Committee on Appropriations, Subcommittee on Agriculture and Related Agencies, U.S. House of Representatives, 95th Congress, Second Session, Investigative Report on "Utilization of Federal Laboratories," U.S. Government Printing Office, Washington, D.C., February 21, 1978.
- 1978 - National Science Board, "Basic Research in the Mission Agencies, Agency Perspectives on the Conduct and Support of Basic Research" (Chapter Eight), U.S. Government Printing Office, Washington, D.C., March 1978.
- 1978 - U.S. General Accounting Office, "The Multiprogram Laboratories: A National Resource for Nonnuclear Energy Research, Development, and Demonstration" (EMD-78-62, May 22, 1978).
- 1979 - U.S. General Accounting Office, "Possible Mismanagement and Overpayment of Outside Consultants by the Nuclear Regulatory Commission" (EMD-79-37, Mar. 7, 1979).

DEPARTMENT/AGENCY AND FACILITIES VISITED

Department of Defense:

Department of the Army:

Chemical Systems Laboratory (note a)
Engineers Topographic Laboratory (note a)
Harry Diamond Laboratories (note a)

Department of the Navy:

Naval Research Laboratory (note a)
Naval Surface Weapons Center (note a)

Department of the Air Force:

Flight Dynamics Laboratory (note a)
Materials Laboratory (note a)

Department of Commerce:

National Bureau of Standards:

Thermophysical Properties Division (note a)

National Oceanic and Atmospheric Administration:

Environmental Research Laboratories (note a)

National Telecommunications and Information Administration:

Institute for Telecommunication Sciences (note a)

Department of Energy:

Idaho National Engineering Laboratory Radiological
and Environmental Sciences Laboratory (note a)

Department of Housing and Urban Development

National Aeronautics and Space Administration:

Lewis Research Center (note a)

Nuclear Regulatory Commission

United States Postal Service:

Research and Development Department Laboratories
(note a)

a/Laboratories visited.



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

PROCUREMENT AND SYSTEMS
ACQUISITION DIVISION

B-175132

APR 21 1979

The Honorable Harold Brown
The Secretary of Defense

Attention: Assistant Secretary of Defense
(Comptroller)

Dear Mr. Secretary:

We have recently completed a review of interagency utilization of Federal laboratories (code 952216) requested by the Chairman of the Subcommittee on Energy, Nuclear Proliferation, and Federal Services of the Senate Committee on Governmental Affairs. In the course of our work at the Department of Defense (DOD), we examined the Defense policy on non-defense work in DOD laboratories. Interpretation and implementation of current policy varies among the Military Services and among various facilities. Availability of DOD laboratories for appropriate interagency tasks may be unduly limited by the current lack of clear policy and resulting problems of implementation.

In a 1972 GAO report on "Means for Increasing the Use of Defense Technology for Urgent Public Problems," we recommended the Secretary of Defense establish policy and procedures to encourage the greater application of existing defense technology by DOD's research and development centers to civil agency problems. DOD supported the recommendation and issued on June 21, 1972, a memorandum on "Non-Defense Work in DOD Laboratories and R&D Facilities." The memorandum encouraged the Military Services to participate in efforts to apply laboratory expertise to the solution of problems of civil agencies, distinct from work done for defense-oriented agencies such as AEC and NASA. In subsequent memoranda in 1974, 1976, and 1978, DOD has continued to formally encourage work for non-defense agencies, although in 1974 a limitation of three percent of professional staff-years for interagency projects was placed on the individual laboratories.

Although the record indicates that DOD recognizes the importance of making laboratory expertise available to others, current policy guidance encouraging work for others does not seem to have significantly changed the practices at most laboratories or their headquarters' management organizations. While some progress has been made since our 1972 report, the

B-175132

DOD laboratories continue to do very limited amounts of non-defense work for other Federal agencies. According to DOD research and development officials, non-defense work rarely approaches the three percent staff limit imposed on the laboratories in 1974.

We noted considerable resistance to the idea of "non-defense" laboratory work for other agencies. A number of research and development officials believe that the laboratories should avoid work for others unless it also directly serves a defense need. It was suggested that the three percent staff limitation implies that DOD discourages any non-mission work.

Hesitation on the part of Defense laboratories to provide reimbursable services to other Federal agencies may also be traceable to residual effects of the so-called "Mansfield Amendments" (in the 1970 and 1971 Armed Forces Appropriations Authorization Acts). As we pointed out in our 1972 report, these restrictions limited the use of DOD research funds to projects with military relevance, but were never intended and should not be interpreted to discourage DOD laboratories from performing research and development tasks requested and funded by other Federal agencies.

The Defense Department has the most extensive array of internal research and development facilities in the Federal Government. Without question, those facilities should be primarily dedicated to fulfillment of defense missions. However, they are also national technical resources, and their utilization should not be artificially inhibited by agency boundaries.

We believe that it is necessary at this time for DOD to clarify and renew its policy for non-defense work in the laboratories--especially as it relates to work for other Federal agencies--and widely promulgate it throughout the Defense research and development establishment. We discussed this matter with DOD officials. While they generally agreed with our observations, they noted that staffing limitations in the laboratories are a major impediment to increased work for other agencies. Given these limitations, we think it doubly important for DOD to provide clear guidance to its laboratories on the use of their resources to respond to national needs.

We would appreciate receiving your comments on our observations within 30 days, in order to incorporate them in our overall report on interagency laboratory utilization, a copy of which will be sent to you. A copy of this letter is being sent to the Subcommittee Chairman. Copies

B-175132

are also being sent to the Departments of the Army, Navy, and Air Force and to the office of the Deputy Under Secretary of Defense for Research and Advanced Technology. If you have any questions, please contact Beverly Lovelady or Richard LeBaron on 275-3195.

Sincerely yours,

for J. H. Stolarow
J. H. Stolarow
Director



RESEARCH AND
ENGINEERING

THE UNDER SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

13 JUN 1979

Mr. J. H. Stolarow
Director, Procurement and
Systems Acquisition Division
General Accounting Office
Washington, D. C. 20548

Dear Mr. Stolarow:

Thank you for your letter of 21 April which reported on your review of interagency utilization of Federal laboratories (Code 952216). In your review, you examined the Defense policy on non-Defense work in DoD laboratories. In general, we agree with your findings; however, we would like to make the following points.

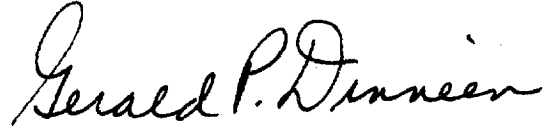
The DoD recognizes the value of interagency performance of science and technology endeavors and encourages it. This not only conserves scarce technical resources but it also permits broader views to be applied to solving technical problems. It also permits investigations from other agencies, universities and industry to use unique facilities and specialized equipment in DoD R&D centers. We were pleased to note the interagency cooperation between DoD and other agencies cited in the review, particularly NASA and DoE. In addition to our laboratories, the DoD-sponsored Federal Contract Research Centers perform R&D for other Government agencies.

As you know, we are under manpower constraints imposed both by the Administration and by the Congress. Currently our authorized manning, both military and civilian, is quite stringent. Recognize that the Defense laboratories compete with other Defense functions such as operations, logistics, training, etc., for these scarce manpower authorizations. This limits the amount of non-Defense related work which the DoD laboratories perform.

In the face of these restrictions, however, our policies do permit, as you point out, the laboratories to expend up to three percent of professional staff-hours on the solution of civilian agency problems. We

do encourage the laboratories with special expertise to solve unique technical problems for other agencies, whether or not the problem is related to Defense work. We are careful, however, not to compete with industry, particularly small business, in this work.

Thank you for the opportunity to comment on your findings.



Gerald P. Dinneen
Principal Deputy

Single copies of GAO reports are available free of charge. Requests (except by Members of Congress) for additional quantities should be accompanied by payment of \$1.00 per copy.

Requests for single copies (without charge) should be sent to:

U.S. General Accounting Office
Distribution Section, Room 1518
441 G Street, NW.
Washington, DC 20548

Requests for multiple copies should be sent with checks or money orders to:

U.S. General Accounting Office
Distribution Section
P.O. Box 1020
Washington, DC 20013

Checks or money orders should be made payable to the U.S. General Accounting Office. NOTE: Stamps or Superintendent of Documents coupons will not be accepted.

PLEASE DO NOT SEND CASH

To expedite filling your order, use the report number and date in the lower right corner of the front cover.

GAO reports are now available on microfiche. If such copies will meet your needs, be sure to specify that you want microfiche copies.

AN EQUAL OPPORTUNITY EMPLOYER

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

**OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300**

**POSTAGE AND FEES PAID
U. S. GENERAL ACCOUNTING OFFICE**



THIRD CLASS

