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There is a need for a unified presentation of Federal Research and Development (R&D) budgetary information according to "defineable user patterns." An agency-wide structure for the Department of Housing and Urban Development contributed to the development of a conceptual foundation for the government-wide structure, which is called the "Unified Classification Structure for Federal Research and Development." The categories in the structure have been designed to identify specific national objectives which are of concern or interest to the Congress. The proposed structure will be a supplementary categorization of total funding for all research by national objective. The Office of Management and the Budget (OMB) stated that a useful course of action would be to develop some limited supplementary R&D data on an interagency basis to cover specific problem areas identified by the Congress, thus avoiding the collection of too much data. OMB also concluded that the GAO system be rationalized with other efforts. OMB also stated that the GAO system would cause more work for the agencies and OMB and would lead to arbitrary classifications. Findings/Conclusions: Information satisfying the need for unified funding information should enable users to determine the level of commitment to specific national objectives, to ascertain the interrelationships among different agencies' R&D activities, to facilitate identifying areas where more effective coordination is necessary, and to evaluate whether research funding is in line with priorities. Existing information sources do not provide readily useable information identifying the level of R&D funding by agency committed to specific national objectives. Recommendations: OMB should require that budgetary data on Federal R&D activities be collected in accordance with the unified classification structure, and submitted to Congress utilizing FY-78 information as soon as possible. (Author/SS)

REPORT TO THE CONGRESS



*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*

Need For A Government-wide Budget Classification Structure For Federal Research And Development Information

GAO identified a need for a unified presentation of all Federal research and development funding which would indicate the amount of Federal funds each agency commits to specific national objectives. This report discusses the Government-wide budget classification structure for research and development activities developed by GAO and recommends its implementation.



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

B-115398

To the President of the Senate and the
Speaker of the House of Representatives

This report recommends implementation of a proposed unified budget classification structure for Federal research and development information.

This work was performed in response to our responsibilities set forth in title VIII of the Congressional Budget Act of 1974. Under title VIII, the General Accounting Office is responsible for (1) identifying and specifying the needs of the committees and Members of Congress for fiscal, budgetary, and program-related information and (2) developing classification structures for use by all Federal agencies in supplying such information to the Congress.

A copy of this report is being sent to the Director, Office of Management and Budget.

A handwritten signature in cursive script, appearing to read "James B. Stuckel".

Comptroller General
of the United States

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ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office
HEW	Department of Health, Education, and Welfare
HUD	Department of Housing and Urban Development
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation
OMB	Office of Management and Budget
R&D	research and development

D I G E S T

The Congressional Budget Act of 1974 requires the Comptroller General to identify and specify the needs of the committees and Members of Congress for fiscal, budgetary, and program-related information and to develop classification structures for use by all Federal agencies in supplying such information to the Congress.

GAO identified a need for a unified presentation of all Federal research and development funding which would indicate the amount of Federal funds each agency commits to specific national objectives. In effect, this presentation would permit a user to determine the goals that Federal research and development is directed toward accomplishing.

This presentation would help the Congress to understand why Federal research and development is conducted, to evaluate resource allocation in relation to priorities, to exercise more effective oversight of Federal research and development activities, and to compare these activities among various agencies.

GAO reviewed a number of sources of research and development budgetary information. They included the Budget of the U.S. Government, the National Science Foundation's Analysis of Federal R&D Funding by Function, the Federal Council for Science and Technology's fiscal year 1976 "R&D Program," and specialized subject reports. The various presentations currently available are designed and used to satisfy information needs which differ from the needs addressed in this report. Existing information sources do not provide readily usable information identifying the level of research and development funding committed by all agencies to specific national objectives.

Based on GAO analysis and extensive contributions from officials and staff members of a number of

agencies and congressional committees, GAO developed a unified classification structure for Federal research and development. The approach which GAO recommends is intended to supplement the current approach to presenting research and development budget information and should help the Congress to understand, evaluate, oversee, and guide Federal research and development activities.

In September 1975, GAO sent the proposed structure to the Office of Management and Budget for implementation. The Office of Management and Budget agreed to gather data on selected categories of the structure for presentation with the fiscal year 1977 budget. Fourteen agencies provided information for this partial data collection effort, which included 7 of the structure's 13 categories. This partial test demonstrated that the Office of Management and Budget and the agencies are able to familiarize themselves with this system and its definitions, implement the new structure, and present the information to the Congress in a timely manner. In addition, the Director, Office of Management and Budget, stated "we believe that it would be extremely desirable to test a system through a dry run after the 1977 Budget is submitted" However, the Office of Management and Budget staff never conducted the full test of the structure which the Director proposed.

GAO recommends that the Director, Office of Management and Budget, require that budgetary data on Federal research and development activities be collected in accordance with the unified classification structure proposed in this report. This presentation would supplement existing budgetary presentations and should include prior, current, and budget year information.

This information cannot be incorporated in the regular budget process for fiscal year 1978. However, it should be presented to the Congress, utilizing fiscal year 1978 information as soon as possible. Starting with the fiscal year 1979 budget, the Office of Management and Budget should include this budgetary data in the regular budget process

and present it to the Congress concurrently with the annual budget submission.

The Office of Management and Budget disagrees with GAO's recommendation in this report. (See ch. 5.) The Office of Management and Budget questions the desirability of investing the resources required to implement the structure and whether the proposed structure would provide more information than the Congress needs. The Office of Management and Budget also believes that GAO's proposed classification structure should not be adopted at this time in view of other budget classification developments taking place. GAO believes that because the research and development activities are included in so many agency budgets, they are difficult to look at in a cohesive manner without a major change in structure. This across-the-board restructuring is possible in a supplementary presentation. Therefore, GAO does not believe that the objections raised by the Office of Management and Budget are sufficient reasons to delay implementing GAO's recommendations.

CHAPTER 1

INTRODUCTION

Section 202 of the Legislative Reorganization Act of 1970, as amended by the Congressional Budget Act of 1974 (Public Law 93-344; 88 Stat. 328) requires the Comptroller General to (1) identify and specify the needs of the committees and Members of Congress for fiscal, budgetary, and program-related information and (2) develop classification structures for use by all Federal agencies in supplying such information to the Congress.

As a preliminary step in fulfilling our earlier responsibilities to identify congressional information needs under the Legislative Reorganization Act of 1970, we interviewed staff members representing 44 committees and 69 Members of Congress. From these interviews, we identified and reported a congressional need for classifying budgetary information according to "definable user patterns." ("Budgetary and Fiscal Information Needs of the Congress," Nov. 10, 1972, B-115398.)

Congressional staff members identified Federal program or project objectives as an important user pattern for which a classification structure was needed. The staff of the House Committee on Science and Astronautics (now the Committee on Science and Technology) emphasized that a classification structure should be prepared and budget information should be presented for overall Federal research and development (R&D) activities. This staff indicated that they need budget information on a number of particular topics in terms of what agencies are involved and the dollar extent of their involvement so that they can more effectively evaluate the related National Aeronautics and Space Administration (NASA) and National Science Foundation (NSF) activities.

In our subsequent work, we assisted in the development of the objective- or program-oriented classification structure now used in the budget justifications for the Research and Technology Account of the Department of Housing and Urban Development (HUD). The structure was tailored to HUD's R&D efforts with summary levels to facilitate interagency comparisons. This agency-oriented structure contributed to the development of a conceptual foundation for the Government-wide structure. The Government-wide structure was designed to provide a hierarchy of objective or problem categories to which individual R&D efforts could be assigned on the basis of their primary purpose, regardless of who was performing or funding them.

In addition to the HUD research account structure, we initiated work with the House and Senate Appropriations Committees and the House Committee on Science and Astronautics to improve the budget structures of NSF and NASA. We determined that these two budgets included research efforts committed to similar activities, for example, specific astronomy objectives, weather research, or pollution monitoring. However, the agencies presented information and discussed related projects in a manner which made comparisons and analysis very difficult.

After a preliminary review of these budgets, we deferred this work in order to develop a unified presentation which indicates the amount of funds that each agency commits to specific national objectives. These national objectives comprise the summary level of our classification structure. We chose these categories because they received continuing interest in the information presentations discussed in chapter 4 and in numerous discussions with congressional staff and agency personnel. We concluded that this unified presentation would facilitate understanding the total Federal R&D effort, making interagency comparisons, and coordinating these R&D activities. While helping us develop this presentation, several executive branch officials who prepare and use R&D information emphasized the need for such a presentation.

The recent recommendations of the Subcommittee on Domestic and International Scientific Planning and Analysis of the House Science and Technology Committee further support the need for a structure such as we are proposing. Two of the Subcommittee's recommended guidelines for Office of Science and Technology Policy reports in Special Oversight Report No. 1 are these:

1. Federal R&D "should be reviewed not only through its individual components but also as a whole. * * * We must develop an ability to view the research and development budget in its entirety so that the total national effort can be evaluated."

2. "The report should relate specific scientific and technological activities * * * to particular national goals."

We are currently involved in a number of activities to improve the budget information provided to the Congress. One of these activities is a study of recommendations from a bipartisan congressional Commission on Government Procurement recommending a mission budgeting approach for funding Federal R&D. The Commission approach would reorganize the budget on the basis of primary purposes or missions to be

served by proposed expenditures. If mission budgeting is implemented in the future, some of the "crosscutting" information provided by the structure in this report would be more readily available through the normal budget process, except for activities categorized in the technology base. However, crosscutting information based on national objectives which transcend agency missions is needed now and will continue to be needed for Federal agency R&D work which is not uniquely related to single agency missions. (A discussion of our other activities to improve budget information is included as appendix I.)

CHAPTER 2

GAO-DEVELOPED STRUCTURE.

Based on our analysis and extensive contributions from representatives of a number of agencies and congressional committees, we have prepared a Unified Classification Structure for Federal Research and Development. (This structure is presented in outline form in app. II.) The complete definitions and instructions for the structure include definitions of each category in the structure, instructions on research to be included in and excluded from each category, and directions for agencies to follow in preparing their submissions. (Sample structure definitions are presented in app. III. The complete definition and instruction package, app. IV, which has been printed and bound separately, is available from us on request. It is identified as PAD-77-14A. Since the categories in the structure are not always self-explanatory, users should refer to this complete definition set to determine what is included in a category.)

For assistance in preparing definitions for the structure, we worked with many of the agencies conducting the largest research efforts directed toward most of the objectives in the structure. For example, we coordinated the definitions for the Diseases and Injuries category in the Health objective with the Director's Office at the National Institutes of Health. During this process, we used agency budget justification materials, internal management documents, classification schemes, and definitions to develop the structure and define its categories. The close working relationships which developed helped research program managers and budget officers contribute valuable conceptual and editorial suggestions to the definitions. This procedure also enabled the participating agencies to suggest definitions which accommodated their research programs. In addition, since the information we are requesting from agencies is not routinely available, we wanted to give the agencies an opportunity to become familiar with our system so that they could use it better.

The categories in the structure have been designed to identify specific national objectives which are of concern or interest to the Congress and its committees. Each category in the structure (whether the most general or most detailed) is to be taken as exclusive of any other category. A research project will be assigned only to the category which represents the primary purpose for which the research is funded. These requirements eliminate double-counting and enable identification of the amounts of Federal R&D funds directly contributing to specific national objectives.

In order to provide precise information, the R&D budgets of each agency's bureaus or bureau-level equivalents should be presented in accordance with the structure, as should the agency's total R&D funding.

The proposed structure will be a supplementary categorization of total funding for all research by national objective, regardless of the performing agency's mission. For the Department of Defense (DOD) and the National Aeronautics and Space Administration, which have broad charters to conduct R&D to accomplish their missions, work that is conducted exclusively to further that mission will be separated from work having clear potential to help achieve the national objectives identified in the structure (all categories except Military, Science and Technology Base, and Space Flight Systems Technology). DOD and NASA R&D having such potential will be included as a part of the funding for those categories instead of being shown in Military or Space Flight Systems Technology.

Assigning applicable DOD and NASA funds to categories in which other agencies are also involved is essential to enable comparison and evaluation of overall Federal R&D funding committed to specific national objectives. For example, possibly as much as \$1.5 to \$2 billion of the fiscal year 1977 DOD research, development, test, and evaluation appropriation of \$10.5 billion is for R&D in areas which have a clear potential to help achieve national objectives outside of the military mission.

We also recognize that some research is conducted to enhance understanding of a subject and has no clear connection with any particular national objective. This kind of discipline-oriented or multidirectional research should be included in the Science and Technology Base category.

Although this approach to classifying R&D budgetary data may not satisfy all congressional requests, it will answer many questions which either cannot now be answered or require considerable time and expense from executive branch agencies and GAO. For example, a committee chairman requested that we answer the following questions:

- What agencies conduct solar energy research and development?
- What is the total Federal commitment to solar energy R&D?
- What solar energy R&D objective receives the major emphasis?

The data presentation we propose would answer the preliminary questions and would provide the information base which will permit the Congress to exercise more effective oversight and coordination.

To implement this classification structure, each agency will assign its R&D funds to categories which it deems most appropriate using the definitions which accompany the structure. Executive agency personnel who are responsible for managing R&D would have the information needed to assign their projects to the appropriate categories in our structure more accurately than external analysts.

We believe the material accompanying the structure defines the categories in an accurate and usable manner. However, we realize that improvements may be made after agencies have used the structure as a basis for presenting supplementary budget information and provided comments based on this experience. Congressional experience in using the information may also reveal further improvements which need to be made. Although we have received some proposed changes, we have deferred including them until after the entire structure has been used and all recommended changes can be considered.

As the structure and its accompanying definitions are used and refined, changes in the kind of information provided may become desirable. During the partial implementation which OMB conducted, time limitations did not permit gathering information on precise subsets of categories in the structure. For example, totals for aircraft noise abatement were not provided in the Control and Abate Pollutants/Noise category. When the structure is fully implemented, total funding committed to this and other such subjects will be available. New subjects within categories or new categories can be added to meet new needs generated by specific interest. In further development of the structure, coding might be added to categorize each research project's secondary payoffs. With this coding, the structure could reveal both primary and closely related research for any given objective.

In September 1975, we sent the proposed structure to the Office of Management and Budget (OMB) (see app. V) and recommended that OMB request agencies to furnish this information. OMB agreed to gather data on selected categories of the structure for presentation with the fiscal year 1977 budget. (See app. VI.) Fourteen agencies provided information for this partial data collection effort, which included all or part of 7 of the structure's 13 categories. This test demonstrated that OMB and the agencies are able to familiarize themselves

with this system and its definitions, implement the new structure, and present the information to the Congress in a timely manner. (An example of the data obtained for the selected categories is shown in app. VII.) The committees and subcommittees which received this first test data found it to be useful, and some of them relied on it during hearings and mark-up sessions.

CONCLUSIONS

We have found that the Congress and its committees need improved information on Federal R&D activities. This could be accomplished to a great degree by presenting Federal R&D budgetary information annually in accordance with a single classification structure representing the national objectives the research is intended to achieve. Information compiled in this manner should be of significant value to the Congress as it analyzes, oversees, and guides R&D resource allocation.

The unified classification structure outlined in this report (see app. VII for an example) was partially implemented during the fiscal year 1977 budget preparation process. This partial implementation successfully demonstrated that information on the Federal R&D effort can be collected, presented, and used in a more rational and effective manner than heretofore has been possible.

RECOMMENDATION

We recommend that the Director, OMB, require that budgetary data on Federal R&D activities be collected in accordance with the unified classification structure proposed in this report. This presentation would supplement existing budgetary presentations and should include prior, current, and budget year information.

Since this requirement cannot be incorporated in the regular budget process for fiscal year 1978, this information should be presented to the Congress utilizing fiscal year 1978 information as soon as possible. Starting with the fiscal year 1979 budget, OMB should include this budgetary data in the regular budget process and present it to the Congress concurrently with the annual budget submission.

CHAPTER 3

WHY A GOVERNMENT-WIDE CLASSIFICATION STRUCTURE

FOR RESEARCH AND DEVELOPMENT IS NEEDED

Traditionally, the Congress views R&D in the context of each agency's specific programs. During our interviews and meetings, staff members of some committees with jurisdiction over R&D discussed the need to review R&D budgets in a Government-wide context and the inability of existing sources to provide them the information they needed to do so. They emphasized a need for an information system which cuts across agency lines on subjects such as air pollution control and abatement, energy, materials, and astronomy. In addition, various congressional staffs have requested that GAO and other agencies conduct surveys in order to provide this type of information about specialized subjects.

The presentation described in this report would enable the Congress to see how Federal R&D dollars have been and are proposed to be applied to a single set of understandable national objectives.

CONGRESSIONAL PRECEDENT

The need for additional R&D information became apparent during the energy shortage of 1973-74 when the Appropriations Committees recognized that energy R&D demanded high priority attention. In order "to gain an overview of the thrust of the Federal energy research and development efforts" and to provide the necessary emphasis that this "crisis" required, the Appropriations Committees consolidated the appropriations for all energy R&D conducted by seven agencies and numerous bureaus in the Special Energy Research and Development Appropriation Act, 1975.

Although this legislation was a reaction to the energy shortage, the Appropriations Committee indicated that an adequate mechanism for determining an individual agency's and the total Federal commitment to energy R&D goals was not available and one was needed. The supplementary information we discuss in this report should help the Congress to determine the specific national objectives towards which Federal funds are committed and to apply resources as appropriate.

IMPROVED ANALYTICAL AND OVERSIGHT CAPABILITY

A presentation of Federal R&D dollars using a single, relatively constant and comprehensive structure of specific national objectives should improve the Congress' analytical and oversight capability in two important ways.

First, by requiring all agencies to assign their research projects to a common set of national objectives, this supplementary presentation will enable users to determine more easily the purposes for which Federal R&D funds are being spent. With this unique budgetary information, users can better understand, compare, and analyze both agency R&D budgets and the total Federal commitment to R&D. This will in turn permit more effective examination of existing and planned R&D resource allocation in relation to national objectives.

We have found that inadequate resources are available for effective R&D in certain areas. In "Federal Programs for Research on the Effects of Air Pollutants," RED-76-46, December 11, 1975, we reported that inadequate resources are committed to develop an information base for air quality standards. Also, in "Research and Development Programs to Achieve Water Quality Goals: What the Federal Government Needs to Do," B-166506, January 16, 1974, we found that research on thermal discharge from power plants has been delayed because of limited funding. A crosscutting view of all Federal R&D activities would permit the Congress to consider whether R&D resources are being applied in line with national priorities.

Second, linking research to national objectives will show where more effective coordination is required among participating Federal agencies. Over the last 2 years, we have published several reports on specific Federal R&D activities which discussed the absence or inadequacy of coordination among agencies involved in those activities. ^{1/} In these reports, we found that the absence of effective coordination of these activities hurt the programs involved and often resulted in inefficient use of resources. We concluded that effective coordination of the use of resources is essential.

To coordinate Federal R&D efforts, the information presented in accordance with our structure will help agencies

^{1/}"GAO Reviews of Federal Environmental Research and Development," RED-76-95, Apr. 7, 1976; "Federal Programs for Research on the Effects of Air Pollutants," RED-76-46, Dec. 11, 1975; "Federal and State Solar Energy Research, Development, and Demonstration Activities," RED-75-376, June 10, 1975.

compare their related research activities. This will help identify and therefore decrease unnecessary duplication among research projects and insufficient coverage of specific national objectives.

Since this supplementary information will present prior, current, and budget year funding assigned to the same or similar categories, analysis of trends and changes in the Federal R&D commitment to specific national objectives will also be facilitated.

In addition, our review of information dissemination on air and water pollution research and materials R&D ("Federal Materials Research and Development: Modernizing Institutions and Management," OSP-76-9, Dec. 2, 1975) revealed inadequate central organization in the Federal Government for identifying and coordinating available research results and information. Since the information provided in accordance with our structure would indicate the national objectives to which various agencies are committing their resources, this information could be used to identify the agencies conducting research in areas of specific interest. In turn, the user could ask the agencies identified in this manner about research results or products in these areas. In other words, the information presented in our structure could be used as a preliminary means of identifying agencies which may be able to disseminate information on specific research activities.

THE NATIONAL SCIENCE AND TECHNOLOGY POLICY,
ORGANIZATION, AND PRIORITIES ACT OF 1976

On May 11, 1976, the President signed into law H.R. 10230, the National Science and Technology Policy, Organization, and Priorities Act of 1976. This act (1) establishes a science and technology policy for the United States, (2) provides scientific and technological advice and assistance to the President, and (3) provides a comprehensive survey of ways and means for improving the Federal effort in scientific research and information handling. More specifically, this act emphasizes needs for centralizing policy planning, identifying public problems and objectives, mobilizing scientific and technological resources for important national programs, and meeting the "responsibility of the Federal Government * * * to coordinate and unify its own science and technology information systems."

We believe that the presentation of the total Federal R&D budget in a single structure of national objectives would contribute greatly to the achievement of legislative goals outlined above and is consistent with the overall intent of the legislation.

CONCLUSION

The Congress needs a means of viewing the total Federal R&D funding commitment to various subjects on a basis which cuts across agency lines. Information which will satisfy this need should enable users to determine the level of commitment to specific national objectives, to ascertain the interrelationships among different agencies' R&D activities, to facilitate identifying areas where more effective coordination is necessary, and to evaluate whether research funding is in line with priorities.

We believe the classification structure described in this report offers the most thorough and efficient way of helping to analyze and oversee Federal R&D.

CHAPTER 4

EXISTING RESEARCH AND DEVELOPMENT PRESENTATIONS

In addition to the individual agency budget justifications, there are several sources of Government-wide R&D budgetary information. We have examined the more prominent Government-wide presentations and have concluded that they are designed and used to satisfy information needs which differ from the needs we address in this report. These presentations were not intended to and do not provide a timely supplementary comparison of agencies' Federal R&D funding indicating relative funding applied to specific national objectives. They include the Budget of the U.S. Government, the National Science Foundation's Analysis of Federal R&D funding by function, the Federal Council for Science and Technology's fiscal year 1976 "R&D Program," and specialized subject reports. A discussion of each follows.

THE BUDGET OF THE U.S. GOVERNMENT

The Budget of the U.S. Government includes a section entitled "Federal Program by Function" containing information on R&D, Special Analysis P on Federal Research and Development Programs, and several other special analyses that include limited information on research and development.

"Federal Program by Function"

The "Federal Program by Function" section of the Budget of the U.S. Government displays all Federal funding on a functional basis. It is designed to accomplish for the entire Federal budget what we seek to accomplish for R&D: to facilitate understanding and analysis. In our presentation we employ concepts similar to those used in preparing the "Federal Program by Function." The categories transcend agency or organization lines and activities and are assigned to their primary purpose on a mutually exclusive basis. In other words, they are assigned only to the one category which reflects their primary purpose.

In chapter 3 of this report, we discussed our purposes for creating a new presentation of Federal R&D budget information. These purposes cannot be achieved with the level of detail contained in the "Federal Program by Function." For example, the functions which do include an R&D category show amounts which generally do not correspond to amounts shown in related categories in other Government-wide R&D surveys. Not all functions in the "Federal Program

by Function" include a subfunction or line item for R&D. The following information from the fiscal year 1977 Budget illustrates these two points.

NATURAL RESOURCES, ENVIRONMENT, AND ENERGY

(in millions of dollars)

Program or agency	Outlays				Recommended budget authority for 1977 ¹
	1975 actual	1976 estimate	TQ estimate	1977 estimate	
Energy:					
General operating programs.....	66	369	41	478	689
Regulation.....	104	172	44	178	171
Research and development.....	1,441	2,051	544	2,677	3,078
Energy Independence Authority ²				42	42
Subtotal, energy.....	1,611	2,592	629	3,375	3,981
Pollution control and abatement:					
Sewage plant construction grants..	1,938	2,350	600	3,770	(³)
Other.....	585	737	216	618	631
Subtotal, pollution control and abatement.....	2,522	3,087	816	4,388	631

¹ Information on budget authority for 1975, 1976, and the transition quarter is shown in table 14 of Part 8.
² Because \$6 billion of budget authority will remain unobligated, no new budget authority is requested for 1977.
³ Under proposed legislation, net gains or losses of the Energy Independence Authority will be included within the budget. Gross transactions of this corporation appear off-budget in the annexed budgets section of the budget appendix.

This example demonstrates two aspects of this presentation which fall short of the congressional information needs we have identified. First, the only information presented for Energy R&D is an undefined total for the Federal Government. Our analysis requires detailed definitions and information by agency. Second, some categories, like pollution control and abatement, do not include an R&D line item. A related problem occurs in some subfunctions in which research is combined with other activities. For example, Research and General Education Aids are combined in the Education, Training, Employment, and Social Services function.

Special Analysis P--Federal Research and Development Programs

Special Analysis P summarizes the funding of R&D incorporated in individual agency budgets and briefly explains how the R&D funds are applied to meet general agency or national goals. This analysis presents a summary and highlights of

the fiscal year 1977 budget as it affects Federal funding of R&D, long-term trends in Federal support of R&D, and descriptions of the fiscal year 1977 R&D programs of 11 major agencies.

However, Special Analysis P does not fulfill the need for information indicating the Federal commitment of R&D funds to achieve specific national objectives by agency. Only the following chart from the analysis cuts across agency lines.

CONDUCT OF R. & D. BY MAJOR PROGRAM AREA
(Obligations in billions of dollars)

Program	1975 actual	1976 estimate	TQ estimate	1977 estimate
Conduct of R. & D.:				
Defense ¹	9.6	10.6	2.7	12.0
Space ²	2.5	2.7	.7	2.9
Civilian (other than space).....	6.9	8.0	2.0	8.6
Total	19.0	21.3	5.4	23.5

¹ Includes military-related programs of the Energy Research and Development Administration transferred from the AEC.
² Includes all NASA programs except aeronautical research, space applications (e.g., pollution monitoring, communications, earth observations), energy technology applications, and technology utilization, which are classified as civilian programs.

This summary-level presentation does not include categories which facilitate analysis and oversight of the Federal R&D commitment to specific national objectives.

After this summary and a brief discussion of long-term Federal R&D funding, the analysis discusses the R&D programs of the larger agencies. However, the agency presentations include categories peculiar to each agency. The following chart which shows the Department of Health, Education, and Welfare's (HEW's) R&D budget provides an example of agency specific categories which cause the lack of a basis for comparability.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—RESEARCH AND DEVELOPMENT
(in millions of dollars)

Area and organizational units	Obligations				Outlays			
	1975 actual	1976 estimate	TQ estimate	1977 estimate	1975 actual	1976 estimate	TQ estimate	1977 estimate
Conduct of R. & D.:								
Health:								
National Institutes of Health.....	1,856	1,797	407	1,578	1,630	1,878	439	1,959
Alcohol, Drug Abuse, and Mental Health Administration.....	140	125	32	128	114	91	20	88
Food and Drug Administration.....	35	36	9	45	27	28	7	32
Center for Disease Control.....	41	44	12	50	42	43	6	38
Health Resources Administration.....	42	34	5	32	60	34	25	27
Assistant Secretary for Health.....	6	13	2	14	6	11	2	12
Health Services Administration.....	17	14	3	2	10	14	3	5
Subtotal, health.....	2,187	2,063	470	2,249	1,889	2,099	512	2,201
Education:								
Office of Assistant Secretary for Education.....	12	12		12	11	12		11
Office of Education.....	55	102	7	102	51	68	19	92
National Institute of Education.....	70	70	20	90	83	70	14	88
Subtotal, education.....	141	184	27	204	145	150	33	191
Welfare:								
Office of Human Development.....	59	62	13	56	42	54	15	57
Social Security Administration.....	23	26	7	27	21	22	5	25
Departmental Management.....	26	25	7	25	9	32	11	30
Social and Rehabilitation Service.....	9	9	2	9	2	9	2	8
Subtotal, welfare.....	117	122	29	117	74	117	33	120
Total conduct of R. & D.	2,385	2,369	526	2,570	2,108	2,366	578	2,512
Conduct of research, included above.....	1,890	1,901	437	2,070	1,681	1,932	471	2,031
Conduct of development, included above.....	465	468	89	500	427	434	107	481
R. & D. facilities:	39	27	4	11	81	38	5	26
Total	2,434	2,396	530	2,581	2,189	2,404	583	2,538

In the material presented for some agencies, the information is presented in a general narrative with little specific detail. For example, the following paragraphs were used to describe the Department of Agriculture's \$507 million R&D budget.

"Obligations of the Department of Agriculture for the conduct of research and development, excluding construction of facilities, will increase from \$483 million in 1976 to \$507 million in 1977.

"At no time in recent history has the need for new technology for increasing our capacity to produce food been more apparent. In addition to reductions in reserves of basic commodities, consumers face higher costs for all

kinds of food and fiber products. Agricultural efficiency is increasingly vital to our national well-being. Improved efficiency in American agricultural production can also help ease critical worldwide food shortages.

"Obligations for basic research will increase from \$177 million in 1976 to \$197 million in 1977. Emphasis will be in such areas as cell biology, improvements in the photosynthesis process, and new research on nitrogen fixation; increased efficiency in the production of meat animals; developing additional sources of usable proteins from vegetable sources; and protecting against devastating losses to major food crops resulting from genetic vulnerability to disease by collecting, testing, and preserving diverse germplasmic materials.

"Environmental research will include the further development of nonchemical means of controlling agricultural pests, and the development of information required for the clearance of agricultural pesticides for use in cooperation with the Environmental Protection Agency.

"The Department of Agriculture, in cooperation with State and private research organizations, will continue development of a national system designed to improve coordination in the planning, financing, and evaluation of agricultural research. The goal of such a system will be to increase the overall efficiency and effectiveness of agricultural research.

These two exhibits demonstrate the purpose of Special Analysis P--to provide summary-level information about the agencies' R&D activities. Sufficient information is not provided to compare different agencies' commitments to similar objectives. For example, both HEW and the Department of Agriculture conduct research to identify pollutant effects. However, the information presented in these two exhibits could not be used to pinpoint the amount of funds committed or the specific objectives involved.

Other special analyses

In addition to Special Analysis P, Federal Research and Development Programs, several other "Special Analyses" include some information on R&D. These special analyses discuss functional areas which include R&D as a related but secondary aspect. Special Analysis I (education), Special Analysis K (health), Special Analysis M (civil rights activities), Special Analysis N (crime reduction), and Special Analysis Q (environmental programs) highlight R&D funding related to these Government-wide activities.

Although this attention to all related Federal R&D activities is informative, the inconsistent approach taken in the different analyses poses certain problems for our purposes. The quality and the approach of the analysis varies from subject to subject. For example, the education R&D analysis is confusing and of limited utility from our perspective because it has minimal narrative material and the following chart combines functional and institutional categories.

FEDERAL OUTLAYS FOR PERSONNEL TRAINING AND RESEARCH IN EDUCATION

Program	Outlays (millions)			
	1975 actual	1976 estimate	TQ estimate	1977 estimate
Education research:				
Educational development.....	77	16	1	2
Elementary and secondary education.....	78	103	34	90
Education for the handicapped.....	38	46	13	56
Occupational, vocational, and adult education.....	45	48	10	34
Special projects and training.....		4	4	19
Assistant Secretary for Education.....	10	11		10
National Institute of Education.....	83	70	13	88
National Foundation on the Arts and Humanities.....	46	80	20	88
National Science Foundation.....	30	32	10	36
Other.....	9	12	1	9
Subtotal, educational research.....	416	422	106	432

In contrast, the health special analysis includes a more understandable chart which indicates the Federal commitment to specific disease groupings and health problems.

FEDERAL OUTLAYS FOR HEALTH RESEARCH AND RESEARCH FACILITIES

(In millions of dollars)

	Outlays			
	1975 actual	1976 estimate	TQ estimate	1977 estimate
Cancer.....	499	572	128	666
Cardiovascular.....	266	286	62	311
Mental health.....	110	127	26	113
Neurological and visual.....	155	174	50	188
Population and family planning.....	58	73	18	65
Environmental health.....	300	408	122	525
Aging.....	53	49	13	63
Metabolic diseases.....	137	197	32	188
Child health.....	72	105	25	96
Infectious diseases.....	130	153	57	160
Pulmonary.....	48	53	12	56
Dental.....	42	46	10	57
Health services research and development.....	79	65	32	51
Other research and development.....	507	519	123	507
Research facilities.....	80	36	5	26
Total.....	2,539	2,862	716	3,074

The differences between these two analyses imply that there is no attempt to prepare them in a consistent manner or to have them reflect specific national objectives. A different problem arises because the various special analyses appear to permit recognition of both primary and secondary research objectives and, therefore, the same research could be reported in more than one section, inflating the level of R&D commitment in those sections. In addition, not all of the special analyses include an R&D category. Consequently, the special analyses do not provide a basis for accurately determining the amount of funds committed to national R&D objectives. Furthermore, they do not list all funds committed by specific agencies to the pertinent categories. Often large amounts are categorized under the catch-all heading of "Other."

From this review of the special analyses contained in the President's Budget, we conclude that R&D information is included on a random basis which, for our purposes, is confusing to use and occasionally insufficient or misleading. Furthermore, the special analyses do not present comprehensive information indicating the Federal R&D commitment to specific national objectives.

NATIONAL SCIENCE FOUNDATION ANALYSIS OF FEDERAL R&D FUNDING BY FUNCTION

The National Science Foundation's Analysis of Federal R&D Funding by Function is prepared annually "to fill the need for examining over a timespan the comparative levels of Federal research and development support provided to selected areas." It is used to analyze trends in Federal R&D programs within a functional framework which reflects national concerns.

The report presents Federal R&D programs in terms of a two- or three-level structure. The categories used are mutually exclusive--dollar amounts are reported only once. We used this report as a starting point for developing our classification structure for several reasons: it offered the most thorough and rational approach to analyzing Federal R&D, the categories described meaningful national objectives, and it provided for interagency comparability.

This report, however, does have limitations which restrict congressional usefulness. Since NSF personnel assign entire agency programs to one function, some dollars are unavoidably misassigned. Related to this problem, the general definitions of the categories are not sufficiently precise to permit a reader to know specifically what is included in each category. Also, the NSF structure is considerably less detailed than we consider necessary. Finally, it is published 8 to 10 months

after submission of the budget to the Congress and therefore is not available in time for the congressional budget process.

REPORT ON THE FEDERAL R&D PROGRAM, FY 1976

The Federal Council for Science and Technology prepared the Report on the Federal R&D Program, FY 1976, which presents the highlights of the fiscal year 1976 R&D program. This document was prepared "to focus more strongly on program content than on budget detail." It discusses major agencies' R&D activities in detailed narratives. In addition, it provides narrative and some budgetary information categorized by agency on R&D activities in high interest functional areas. The report was made available in timely fashion--shortly after the fiscal year 1976 Budget was submitted to the Congress. However, a followup report was not made for the fiscal year 1977 Budget and in May 1976, the Federal Council for Science and Technology was abolished by the National Science and Technology Policy, Organization, and Priorities Act of 1976.

SPECIALIZED SUBJECT REPORTS

Several organizations, including GAO, prepare (both regularly and upon request) reports and analyses on specific Federal R&D activities. Among these are the Federal Health Survey of the National Institutes of Health; along with reports in other subject areas, GAO studies of R&D in the areas of materials, general environmental, and air pollution effects; and the National Academy of Science Study Project on Social R&D. These reports are generally prepared to determine among other things, the total Federal R&D commitment to a specific subject, the level of individual agency commitment to that subject, and the degree of coordination which exists among involved agencies.

Since the information needed for this type of report is not readily available and may require extensive analysis to develop, these reports can be very expensive to prepare. Our proposal that agencies adopt an additional classification system for their R&D projects will also involve additional cost. However, it should be more efficient for agency officials to provide this information about their research projects during the budget cycle than to have individual reports prepared to respond to interest expressed in one specific subject. Furthermore, information provided by the agencies should be more accurate, will include all Federal R&D, will be available for consideration along with the budget, and the process can be easily repeated on an annual basis.

Because these reports generally focus on one specific subject, research which has potential secondary payoffs in that area may be included in them. By including all related research regardless of its primary purpose, these reports often indicate an inflated level of effort committed to their subject. For example, with our structure, research conducted to reduce aircraft engine emissions would be classified primarily in the controlling and abating air pollution category. However, without precise definitions and restrictions on classifying research, this work could be assigned to an energy or air transportation objective where it might have secondary benefits. These latter classifications would inflate in a possibly misleading manner the funding level committed to those objectives. To prevent this situation, we propose that funds be assigned only to their primary purpose.

CONCLUSION

We have found that the Congress needs additional budgetary information on R&D activities. The various presentations currently available are designed and used to satisfy information needs which differ from the needs we address in this report. Existing information sources do not provide readily useable information identifying the level of R&D funding by agency committed to specific national objectives. Therefore, the classification structure described in chapter 2 should be implemented.

CHAPTER 5

OFFICE OF MANAGEMENT AND BUDGET COMMENTS

In an October 26, 1976, letter (app. VIII) the Office of Management and Budget advised us that it disagrees with our recommendation that the Director, OMB, require budgetary data on Federal R&D activities to be collected in accordance with the unified classification structure proposed in this report for presentation in a supplementary document. We continue to support the implementation of the structure and do not consider the problems raised by OMB to be valid reasons to delay implementation of the structure. The issues raised in OMB's letter are discussed below.

NEED TO FULLY IMPLEMENT THE STRUCTURE

OMB stated that a useful course of action would be to develop some limited supplementary R&D data on an interagency basis to cover specific problem areas identified by the Congress, thus avoiding the collection of too much data.

Problems in R&D are becoming increasingly complex and affect many sections of our society and economy. To cope with these more complex problems, the Federal Government must manage its R&D more effectively. An approach to R&D management which facilitates anticipation and analysis of problems, planning solutions to them and committing resources to achieving the desired results, must be established. At the same time, R&D management policy too often is characterized by committing R&D to problems after they have been triggered by crises. Special needs will continue to arise requiring data gathered in specific problem areas. However, the Congress needs more than "some limited supplementary research and development data on an interagency basis to cover specific problem areas identified by the Congress." It needs a full and clear picture of R&D funding on a Government-wide basis for use in making informed decisions and avoiding crisis management. Our structure would provide an important first step in this direction.

Once a comprehensive collection process that provides information to the Congress that can be used in the annual budget review has been established, modification can be made to highlight areas of specific interest in the realistic context of the total R&D budget. Furthermore, reporting on specific areas will be facilitated when the entire structure consists of objective-oriented categories. For example, aircraft noise and traffic control are areas of special interest which have already been included in the structure.

RATIONALIZATION WITH OTHER WORK

OMB refers to the national needs and mission needs efforts of subsection 601(i) of the Congressional Budget Act of 1974 and specific recommendations of the Commission on Government Procurement and concludes that these efforts should be rationalized with ours before any one structure is adopted.

We are involved in a number of activities to improve the budget information provided to the Congress. These are discussed in appendix I.

We recognize the requirements of subsection 601(i) and are taking them into consideration in all of our budget information activities. We do not feel that it is prudent to defer action on the R&D analysis until it is "rationalized" with the approach to be taken to implementing 601(i). We favor attempting to "rationalize" the 601(i) structure with the primary budget structure (the functions and subfunctions), and we are exploring this matter with the organizations involved and exchanging views.

Our ongoing study of the recommendations of the Commission on Government Procurement complements the R&D classification structure proposed in this report. This report proposes to provide the Congress with supplemental budget information showing how the R&D activities of the various Federal agencies relate to national objectives. The purpose of the GAO study of recommendations of the Commission on Government Procurement is to assist the Congress in deciding whether or not it should adopt the mission approach that has been recommended by the Commission. Our latter report will describe and illustrate the new approach and discuss its impact on the congressional budgeting process.

It is true that if the Congress eventually decides to adopt the new approach recommended by the Commission on Government Procurement, the objectives of agency R&D in terms of agency missions should then become clear as part of the normal budget process. This should happen because the budget would be presented in terms of mission end purposes of the agencies. These mission activities of the agencies would in turn be grouped by major Government functions or national needs, and the end use of a portion of the R&D budget would then be visible to the Congress. However, this would still leave the problem of disclosing to the Congress the inter-related objectives of several billion dollars of Federal agency R&D work which is not uniquely related to single agency missions, including technology base and other R&D.

If the mission-oriented approach is adopted, it is likely that it would be implemented on an evolutionary basis over a period of years. R&D activities are included in so many agency budgets that they are difficult to look at in a cohesive manner without a major change in structure. This across-the-board restructuring is possible in a supplementary presentation and should be undertaken now. The unified objective classification structure proposed in this report is needed to fill a current information gap, will serve as a basis for defining national needs if mission budgeting is implemented, and will continue to be needed for Federal agency R&D work which is not uniquely related to single agency missions.

FEASIBILITY OF COLLECTING DETAILED INFORMATION

OMB stated that the detailed presentation required by our structure would be in addition to R&D budget submissions already made by the agencies and would require a considerable amount of agency and OMB effort.

A review of the information collected for the various special analyses of the Budget of the United States indicated that some analyses require considerably more detailed information than the existing analysis for R&D. The demonstrated feasibility of collecting detailed information in such areas as health and education supports the contention that increased R&D information is equally feasible. Once the information system which we describe in this report has been tested and difficulties have been resolved, it may replace the insufficient, summary-level information presented in the existing Special Analysis of Federal Research and Development Programs.

AGENCIES CAN ASSIGN R&D TO APPROPRIATE CATEGORIES

OMB stated that our structure requires arbitrary classification of activities and may lead to inconsistent data.

We acknowledge that this structure may require some arbitrary classifications. OMB's Special Analyses, the National Science Foundation's compilation, and other presentations also require arbitrary classifications. However, we have attempted to reduce this factor by developing, with the extensive assistance of many agencies, a set of scope notes defining each category in the structure and indicating how assignments are to be made. Agency officials will assign R&D to appropriate categories based on these definitions. This will be less arbitrary than assignment by a single agency. We remain steadfast in our belief that our carefully defined, mutually exclusive structure is necessary and desirable because it minimizes arbitrary assignments and displays changes in emphasis when they occur. With respect to secondary payoffs of research, such as OMB's example of energy-related work that is primarily environmental we propose that at a later date a secondary coding scheme be developed which would allow reporting of this sort of payoff. In any event, our first goal is the adoption and use of the standard classification and set of definitions.

AGENCY FAMILIARIZATION

OMB emphasized that sufficient time be allowed for planning, agency familiarization, and a thorough review of the data submitted.

We agree in part. Since we recognized the need for planning and agency familiarization, we carefully contacted all agencies which would play a major role in this information system so that they could participate in developing it. Fortunately, most agencies chose to cooperate with us in this task, and the planning and agency familiarization occurred to a considerable extent while the structure was being prepared.

The level of review required for this data should not differ greatly from that presently accorded other special analyses of the budget, such as education and health. We believe the agencies themselves can best judge the purposes of their research and accordingly should assign their research projects to our structure. While it would be necessary for OMB to review the data for conformance with the budget, this workload does not appear unreasonable, given the publication of other special analyses involving a comparable level of detail. Our discussion with congressional staffs led us to conclude that they are interested in the agencies' best judgments about each research project's primary purpose. We continue to believe that the submission to the Congress of information prepared in accordance with parts of our structure in January and February 1976 demonstrates that this information requirement can be handled by agencies much more easily than OMB contends.

CONCLUSION

During 1975, GAO, OMB, and Department of Treasury staff discussed ways of improving the R&D information which is made available to the Congress. After these meetings, the correspondence presented in appendixes III and IV was exchanged. In responding to the Comptroller General's letter, the Director of OMB agreed to present information on selected critical areas to the Congress concurrently with the budget (app. VI). In addition, the Director stated "we believe that it would be extremely desirable to test a system through a dry run after the 1977 Budget is submitted. . . ." Despite our offers of encouragement and assistance, OMB staff never conducted the test of the structure which the Director proposed.

OUR ACTIVITIES TO IMPROVEBUDGET INFORMATION PROVIDED TO THE CONGRESS

There are a number of activities underway to improve the budget information provided to the Congress. We are involved to varying degrees in most of these activities. They affect the President's Budget, Special Analyses of the Budget, the Appendix to the Budget, agency justifications, and special reports for congressional authorizing committees.

We have two projects underway that relate specifically to R&D information. One has resulted in a proposal for a Government-wide budget classification structure for Federal R&D activities. Information compiled in accordance with this structure should be of considerable value to the Congress as it analyzes, oversees, and guides R&D resource allocation. We have recommended that a supplementary budget presentation using our structure be presented utilizing fiscal year 1978 budget data. Starting with the fiscal year 1979 budget, OMB should include this budgetary data in the regular budget process and present this supplementary presentation concurrently with the annual budget submission.

We are performing a study of recommendations from a bipartisan congressional Commission on Government Procurement which recommended a mission budgeting approach for funding Federal R&D. The purpose of this study is to assist the Congress in deciding whether or not it should adopt a new approach that has been recommended by the congressional commission.

Both of the R&D projects could affect the presentation contained in OMB's Special Analysis--Federal Research and Development Programs. In addition, we are working in areas which affect two other OMB special analyses. We will be recommending improvements in tax expenditure reporting to the Congress, including changes in Special Analysis F--Tax Expenditures. We will also be recommending improvements in information and analysis of Federal credit programs which affect Special Analysis E--Federal Credit Programs.

The Congressional Budget Act of 1974 requires the Comptroller General, in cooperation with the Secretary of the Treasury, the Director, OMB, and the Director of the Congressional Budget Office to develop, establish, maintain, and publish standard terminology, definitions, classifications, and codes for Federal fiscal, budgetary, and program-related

data and information. On August 20, 1976, we published a report entitled "Standard Budget Classifications--Proposed Functions and Subfunctions" (PAD-76-49). This report describes a proposed revision of the Federal budget's functional and subfunctional classifications to move toward better classification as a basis for congressional decision-making. The report recommends increasing the number of functions and subfunctions. This will provide greater flexibility to permit rearrangement of data to meet needs of the various participants in the budget process. We are preparing a presentation of fiscal year 1978 budget data utilizing our proposed structure to provide a basis of comparison that will assist the Congress in deciding on the most appropriate structure.

Subsection 601(i) of the Congressional Budget Act of 1974 requires that the budget contain a mission-oriented presentation tied to national needs beginning with the fiscal year ending September 30, 1979. We are actively working to get as much agreement as possible on this presentation and are considering the requirements of this subsection in our other work in related areas.

We are addressing the funding methods and reporting practices used in the budget. This work emphasizes the need to include all Federal activities in the budget and to include in future budgets the activities that are now being excluded. We are also emphasizing the need to disclose the full cost of programs in the budget.

We are continuing to prepare information requirements documents which address the identified needs for information about programs and include classification structures at this level. This work affects the appendix to the budget by contributing improvements in the activity schedules of these accounts and improves agency justification schedules. Progress on this work was reported on August 30, 1976, in "Progress in Improving Fiscal, Budgetary, and Program-Related Information for the Congress" (PAD-76-64).

We are acquiring, sorting, and providing budget information to authorizing committees presented at the program level. This information is required for formulating the committees' views and estimates with respect to all items to be set forth in the first concurrent resolution on the budget which relate to matters within the respective jurisdictions or functions of the committee. These committee reports are due March 15 of each year. The presentations developed for these committees identify each Federal program and activity authorized

by legislation under the committees' jurisdiction. For each program we identify the budget function and subfunction, the names, titles, and sections of the public laws; the name of the program or activity; the appropriation account number; the administering agency; the amounts authorized (if specified in the authorizing legislation); the expiration dates of the legislation or program; and related budget authority and outlays for the past, current, and budget year. Because of the continuing need for this information, we are developing an automated system to facilitate updating and assembling the required information.

UNIFIED CLASSIFICATION STRUCTUREFOR FEDERAL RESEARCH AND DEVELOPMENT

The following outline presents the line items which compose the Unified Classification Structure for Federal Research and Development. These line items are defined in appendix IV, which is available on request from GAO. In many instances, the definition includes cross-references to related parts of the structure.

Because of the similarities among various research categories and the precise lines which distinguish them, it is imperative that all individuals relying on this structure--either to prepare an agency's submission or to use the information provided--refer to appendix IV so that they know exactly what each category should and does include.

UNIFIED CLASSIFICATION STRUCTURE
FOR FEDERAL RESEARCH AND DEVELOPMENT

I. EDUCATION AND TRAINING

- A. The Learning Process
- B. The Relationship between Education/Training and Society
- C. Education Service Delivery
- D. Vocational Training

II. ENERGY DEVELOPMENT AND CONSERVATION

- A. Petroleum and Natural Gas
 - 1. Improve Resource Assessment
 - 2. Improve Extraction and Processing
- B. Oil Shale
 - 1. Improve Resource Assessment, Exploration and Extraction
 - 2. Improve Upgrading Methods
 - 3. Improve Transmission, Storage and Refining
- C. Coal
 - 1. Improve Resource Assessment
 - 2. Improve Extraction and Processing
 - 3. Convert Coal to Oil or Gas
- D. Nuclear Energy
 - 1. Improve Resource Assessment and Recovery
 - 2. Develop Liquid Metal Fast Breeder Reactor Technology
 - 3. Develop Light Water Breeder Reactor Technology
 - 4. Develop Alternative Breeder Technologies
 - 5. Develop Gas-Cooled Thermal Reactor Technology
 - 6. Improve Light Water Reactor Technology
 - 7. Nuclear Safety
 - 8. Develop Fusion Power
- E. Solar Energy
 - 1. Produce Solar Thermal and Solar Thermal Electrical Energy
 - 2. Develop Photovoltaic Electric Power Systems
- F. Geothermal Energy
 - 1. Improve Resource Assessment
 - 2. Improve Extraction and Processing
 - 3. Convert Geothermal Resources to Thermal and Electrical Energy
- G. Alternative Energy Resources
 - 1. Convert Wind Energy to Electricity
 - 2. Improve Fuel Generation from Bioconversion
 - 3. Improve Ocean Thermal Energy Conversion
 - 4. Other (must be specified and described)
- H. Energy Conservation
 - 1. Increase Electricity Generation Efficiency
 - 2. Improve Energy Storage
 - 3. Improve Electric Power Transmission
 - 4. Reduce Energy Consumption by End-Users
- I. Energy Systems Study and Analysis

III. ENVIRONMENTAL QUALITY IMPROVEMENT

- A. Identify Pollutant Effects**
 - 1. Air
 - 2. Water
 - 3. Solid Waste
 - 4. Pesticides
 - 5. Noise
 - 6. Radiation
- B. Understand Pollution Processes**
 - 1. Air
 - 2. Water
 - 3. Solid Waste
 - 4. Pesticides
 - 5. Noise
 - 6. Radiation
- C. Control and Abate Pollutants**
 - 1. Air
 - 2. Water
 - 3. Solid Waste
 - 4. Pesticides
 - 5. Noise
- D. Understand, Describe, Predict and Affect Weather and Natural Hazards**
 - 1. Regional Environmental Systems
 - 2. Climate and Weather Study
 - 3. Weather Modification
 - 4. Disaster and Natural Hazards Studies and Control

IV. FOOD, FIBER AND OTHER AGRICULTURAL PRODUCTS

- A. Identify and Develop New or Underdeveloped Food and Feed Sources**
- B. Improve Production**
 - 1. Improve Crop Production for Food
 - 2. Improve Animal Production for Food
 - 3. Improve Production of Marine Food Sources
 - 4. Improve Production of Non-Food Items
 - 5. Improve Use of Land, Water, Fertilization, Equipment and Methods
- C. Improve Storage and Processing**
 - 1. Improve Storage and Processing of Food Products
 - 2. Improve Storage and Processing of Non-Food Products
- D. Improve Distribution and Marketing**
 - 1. Improve Distribution and Marketing of Food Products
 - 2. Improve Distribution and Marketing of Non-Food Products
 - 3. Improve Consumption
- E. Improve Safety**

V. HEALTH

- A. Diseases and Injuries
 - 1. The Aging Process--Diseases and Related Conditions
 - 2. Arthritis and Rheumatism
 - 3. Blood Diseases and Disorders
 - 4. Cancer
 - 5. Dental Diseases and Disorders
 - 6. Diabetes and Other Endocrine Disorders
 - 7. Digestive Diseases
 - 8. Environmentally-Caused Health Disorders
 - 9. Eye and Visual System Disorders
 - 10. Genitourinary System Disorders (including Kidney Disease)
 - 11. Heart and Vascular Diseases (including Stroke)
 - 12. Infectious and Parasitic Diseases (including Allergies not elsewhere classified)
 - 13. Injuries Not Related to Diseases
 - 14. Lung and Respiratory Diseases and Disorders
 - 15. Maternal and Child Health (including Genetics not elsewhere classified, Fertility Regulation and Mental Retardation)
 - 16. Metabolic Disorders
 - 17. Musculoskeletal System and Connective Tissue Disorders
 - 18. Neurological and Communicative Disorders
 - 19. Nutritional Disorders
 - 20. Skin and Subcutaneous Tissue Diseases and Disorders
 - 21. Disease and Injury Base
- B. Mental Health
 - 1. Mental Illness and Behavior Disorders
 - 2. Mental Health Aspects of Social Problems
 - 3. Mental Health Base
- C. Substance Abuse
 - 1. Alcoholism
 - 2. Drug Abuse
 - 3. Abuse of Other Substances
- D. Health Services Delivery
 - 1. Improve Quality
 - 2. Control and Reduce Cost
 - 3. Improve Accessibility

VI. HOUSING AND COMMUNITY DEVELOPMENT

- A. Housing
 - 1. Increase Opportunities
 - 2. Improving Safety and Standards
 - 3. Improving Construction, Delivery and Costs
 - 4. Improving Housing Management
 - 5. Improving Housing Maintenance
- B. Community Development
 - 1. Preserve and Revitalize Neighborhoods
 - 2. Community Development and Growth

VII. LAW ENFORCEMENT AND JUSTICE

- A. Prevention of Crime (includes a total for drug trafficking)
- B. Law Enforcement (includes a total for drug trafficking)
- C. Adjudication
- D. Corrections
- E. Juvenile Justice
- F. Understanding of Crime
- G. Justice Technology

VIII. MILITARY

- A. Deter Attack
 - 1. Land-based Missiles
 - 2. Sea-based Missiles
 - 3. Aircraft
 - 4. Deterrent Weapons Development and Protection
 - 5. Command and Control Elements of Nuclear Deterrence
 - 6. Nuclear Deterrence -- General
- B. Defend Continental United States Against Attack
 - 1. Ballistic Missile Warning
 - 2. Ballistic Missile Defense
 - 3. Air Defense
 - 4. Defend Continental United States -- General
- C. Combat Capability
 - 1. Land Warfare
 - 2. Air Warfare
 - 3. Ocean Control
 - 4. Combat Capability -- General
 - 5. Theater Nuclear Forces
- D. Defensewide Applications
 - 1. Intelligence Systems
 - 2. Communications, Command and Control
 - 3. Area Navigation Systems
 - 4. Military Personnel Management and Utilization
 - 5. Biomedicine with Exclusive Military Applications
 - 6. Nuclear Weapons Effects
 - 7. Chemical/Biological Weapons
 - 8. Weather Modifications

IX. NATURAL RESOURCES

- A. Forests
- B. Land
- C. Minerals
 - 1. Improve Means of Locating and Assessing Mineral Sources
 - 2. Improve Mineral Extraction and Recovery Techniques
 - 3. Improve Mineral Processing Techniques
 - 4. Improve Techniques for Reusing and Recycling Materials or Products Made from Minerals
 - 5. Improve Mineral Supply/Demand Analysis

- D. Recreation
- E. Water
- F. Wildlife

X. SCIENCE AND TECHNOLOGY BASE

- A. Astronomy
- B. Atmospheric Sciences
- C. Biology
- D. Chemistry
- E. Computers
- F. Engineering
- G. Geological Sciences
- H. Materials
- I. Mathematical Sciences
- J. Measurement and Standards Technology
- K. Oceanographic Sciences
- L. Physics
- M. Psychology
- N. Science Information Technology
- O. Science Policy, Management Technology and Other Special Programs
- P. Social Sciences
- Q. Surveying, Mapping, Charting and Geodesy
- R. Telecommunications

XI. SPACE FLIGHT SYSTEMS TECHNOLOGY

- A. Space Transportation Systems
 - 1. Space Shuttle
 - 2. Spacelab
 - 3. Interim Upper Stage/Tug
 - 4. Other Space Transportation Systems
- B. Space Flight Equipment Engineering
 - 1. Energy Systems
 - 2. Human Operations in Space
 - 3. Information and Communication Systems
 - 4. Materials Used in Space Vehicles
 - 5. Propulsion Systems
 - 6. Space Vehicle Aerothermodynamics
 - 7. Systems and Design Studies
 - 8. Vehicle and Satellite Structures
 - 9. Vehicle Guidance and Control

XII. TRANSPORTATION

- A. Air
 - 1. Improve Vehicles
 - 2. Improve Aviation Operational Environment and Effectiveness
 - 3. Improve Aviation Safety

- B. Rail
 - 1. Improve Rail Vehicles
 - 2. Improve Operational Environment and Effectiveness
 - 3. Improve Rail Safety
- C. Highway
 - 1. Improve Vehicles
 - 2. Improve Operational Environment and Effectiveness
 - 3. Improve Highway Safety
- D. Marine
 - 1. Improve Marine Vehicles
 - 2. Improve Marine Operational Environment and Effectiveness
 - 3. Improve Marine Safety
- E. Pipeline
 - 1. Improve Pipeline Equipment and Operational Effectiveness
 - 2. Improve Pipeline Safety
- F. Multi- and Inter-modal

XIII. OTHER

- A. Community Services
- B. Foreign Affairs
 - 1. Foreign Aid
 - 2. International Agreements and Foreign Policy
- C. Income Assistance
- D. Manpower
- E. Regulatory Activities
- F. Safety
 - 1. Occupational Safety and Health
 - 2. Consumer Products Safety

PAGES 17-19 OF THE DEFINITIONS ACCOMPANYING
THE UNIFIED CLASSIFICATION STRUCTURE

III. ENVIRONMENTAL QUALITY IMPROVEMENT

Encompasses research to identify pollutant effects in order to establish standards for regulating them, excluding research to improve treatment and cure of illnesses which result from pollutants; to improve means of identifying and measuring pollution processes; to control and abate all pollutants which adversely affect air, water, land, and living things; and to improve the ability to understand, predict, and effect weather and natural hazards.

Research shown here includes all efforts conducted primarily to protect or improve environmental quality. Therefore, research to remove sulfur from coal before it is converted to electricity, and thereby reduce sulfur dioxide emissions, would be shown here as would work to reduce emissions from automobiles or airplanes.

A. IDENTIFY POLLUTANT EFFECTS

Encompasses research to determine the ecological, social, and health effects of environmental pollutants on man, animals (including marine animals), inorganic materials, and plants (including marine plant life) and research to determine the exposure levels at which these pollutants and their effects become dangerous to the various elements of the environment. Research in this category is generally directed toward isolating pollutants which cause adverse effects, in order to establish standards or tolerance levels for regulatory purposes. Furthermore, it usually precedes efforts to improve technological or operational means of controlling and abating pollution or otherwise meeting the above-mentioned standards or tolerance levels. Research on the effects of pesticides and of radiation is also shown here.

Exclude research on identifying and measuring pollutants which is conducted to treat or cure an illness or disease that is caused by a pollutant or to develop a personal preventive device (see V.A., DISEASES AND INJURIES). Exclude research on understanding pollution processes or technological or operational methods to control pollutants which are shown elsewhere in

III., ENVIRONMENTAL QUALITY IMPROVEMENT. Exclude research on food safety thresholds and standards (see IV., FOOD, FIBER AND OTHER AGRICULTURAL PRODUCTS). Also exclude research on occupational safety and health and consumer product safety (see XIII. F., SAFETY).

1. AIR

Includes research on the effects of pollutants carried in the air, such as hydrocarbons. Excludes the effects on air from noise, pesticides and radiation and also excludes air pollution resulting from solid wastes (see the following pertinent categories in this section). Work to be shown here is exemplified by research to study epidemiological and toxicological health effects of air pollutants on man and animals and investigate long-term low-level effects of fossil fuel pollutants during energy conversion.

2. WATER

Includes research on the effects of pollutants, including thermal pollution, found in fresh and salt water excluding pesticides, radiation and pollution resulting from solid waste. Work to be shown here is exemplified by research to:

- Study relationship between water quality and disease;
- Study subsequent generation effects of tritiated ingestion;
- Study birth defects caused by heavy metals;
- Determine effects of asbestos on aquatic life;
- Determine methyl mercury effects on central nervous system of animals; and
- Assess ecosystem costs of thermal shock from power plant waste heat release and cooling tower blow-down.

3. SOLID WASTE

Includes research on the effects of solid waste handling and disposal. Solid waste includes, but is not limited to, animal wastes, crop residues, and municipal solid wastes. This entry specifically includes the effects of solid waste handling which results in air or water pollution. Work to be shown here is exemplified by research to:

Assess public health impact of toxic and pathogenic products of solid waste, waste incineration, landfill, and ocean dumping operations; Determine the environmental effect of coal, oil, oil shale, uranium, and geothermal energy extraction techniques; and Assess environmental effects of hydrocarbon and other fuel transport, storage, or waste releases during waste disposal.

4. PESTICIDES

Includes all research conducted to determine the adverse effects of pesticide use. Work to be shown here is exemplified by research to determine pesticidal effects on particular organs, metabolic reactions, reproduction and behavioral responses and on freshwater and saltwater life.

Exclude research to improve treatment for a health problem caused by pesticide use (see V., HEALTH) and research on food safety that relates to pesticides (see IV. E., IMPROVE SAFETY).

5. NOISE

Includes all research conducted to determine the effects of noise on man, plants and animals. Work to be shown here is exemplified by research to improve health effects data for noise emissions standards and determine the effect of noise on man's ability to concentrate on a task.

Research to determine the effects of aircraft noise should be reported both as a separate item and as a part of the total for this entry.

6. RADIATION

Includes research conducted to determine the effects of exposure to radiation in the general environment from any source. More specifically, this includes work to:

- Measure health effects of ionizing and non-ionizing radiation exposure;
- Investigate long-term low-level effects of radioactive pollutants; and
- Assess environmental effects of radionuclide transport, storage and waste disposal.

COMPLETE DEFINITION AND INSTRUCTION PACKAGE

Because of its size, this appendix has been printed and bound separately. It is available on request from the General Accounting Office (PAD-77-14A).



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

The Honorable James T. Lynn
Director, Office of Management
and Budget

Dear Mr. Lynn:

The General Accounting Office, under the Legislative Reorganization Act of 1970, as amended, has the responsibility, among other things, for (1) identifying and specifying the needs of the committees and Members of the Congress for fiscal, budgetary and program-related information and (2) developing classification structures for use by all Federal agencies in supplying such information to the Congress.

Over the past several months, the General Accounting Office has been developing a unified objective-oriented classification structure for Federal research and development. This structure is being developed to meet an expressed congressional need for a method of viewing Federal research and development in a unified manner across the Federal Government in terms of objectives. The concept underlying the structure is that Federal research and development can be associated with the accomplishment of national objectives or with the solution of national problems.

The latest version of the overall structure is enclosed. With the exception of Food, Fiber and Other Agricultural Products; Foreign Affairs; and Other, the various objectives have been reviewed by agency personnel. We have also enclosed a draft set of guidelines that have been prepared for use in requesting the information from the executive departments and agencies. Further, each level of the structure will be accompanied by a set of definitions which will guide the providers and the users of the associated information. We expect to complete the unfinished segments of the structure by September 26, 1975.

In order to satisfy its needs, the Congress should be provided with special analytical information on Federal research and development funding in accordance with this structure. More specifically, the Committee on Science and Technology, House of Representatives, has requested that information

be provided in accordance with this structure at the time of delivery of the President's Budget for FY 1977. Initially, the presentation of research and development dollar information needs to be provided in terms of obligations at each level of the structure for each department and agency and in total (Government-wide) for the past, current and budget year. It is possible that other information (amounts authorized, budget authority, etc.) may be requested in succeeding years.

We recommend that your Office request the departments and agencies to provide the needed information to you in order that it may be assembled and provided to the Congress within this timeframe. It is our view that this requirement can be handled as a supplementary presentation and thus, not directly affect the method used by the agencies in presenting their basic budget submission to your Office or to the Congress.

Members of the General Accounting Office staff are available to work with the Office of Management and Budget in arriving at the most practical method of meeting this requirement.

Sincerely yours,



Comptroller General
of the United States

Enclosures - 2



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

Honorable Elmer B. Staats
Comptroller General of the
United States
Washington, D. C. 20548

Dear Mr. Staats:

We have reviewed your September 11 letter in which you describe a unified objective-oriented classification structure for Federal research and development that is being developed by the General Accounting Office for the Congress. In particular, your letter states that the House Committee on Science and Technology has requested that information be provided in accordance with this structure at the time of delivery of the President's Budget for FY 1977. The letter contains a recommendation that the Office of Management and Budget request the departments and agencies to provide information so that it is available to the Congress at that time.

This Office recognizes that certain across-agency analysis of research and development activities can be useful to Congressional Committees. Indeed, a great deal of information covering Government-wide efforts in energy research and development has been provided to committees over the past two to three years.

We also appreciate the fact that a great deal of time has been spent by your staff in developing this structure and in describing the boundaries of the various categories. Nonetheless, our review of the proposal suggests that there are basic problems in providing reliable information to meet the needs of the House Science and Technology Committee or other potential users in the detail and on the schedule that you suggest. In fact, our examination leads us to believe that moving ahead too broadly and too rapidly could seriously impair the validity and usefulness of the research and development information to Congress. In addition, moving ahead broadly and rapidly in this and

other specific program areas before the Congressional Budget Office and the Budget Committees have decided what information they will need to carry out the new Congressional Budget Act may pre-empt resources that will be needed to make the new Congressional budget review process work.

Even though the General Accounting Office is devoting considerable attention to describing the boundaries of categories, mutually exclusive categorization inevitably requires compromises in determining how activities are classified by agencies. This can result in not providing pin-pointed information that the Congress may be seeking in particular areas or categories. In order to operate successfully, agencies must familiarize themselves with the system and work out the problems that inevitably arise. This takes time.

The Department of Defense, for example, which accounts for about one-half of the Federal Government's research and development activities, has expressed concern that much of the information requested in the objective-oriented classification is not routinely available within Defense but will require special and significant efforts to obtain. Defense points out the following particular problems:

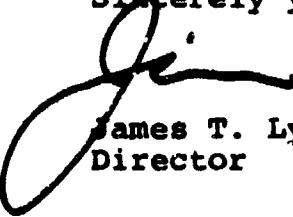
- ° Funding levels are requested on an obligations basis whereas Defense program data are currently compiled on a total obligational authority basis. Unless appropriate conversions are made, Defense data would be inconsistent with total Defense R&D obligations as reported in the R&D Special Analysis.
- ° Research and exploratory development program funding must be distributed over general, non-Defense categories. Such a distribution is not now available and will require considerable technical judgment to execute.
- ° Military personnel, management and support, and test and evaluation costs would have to be distributed among the R&D programs with which they are associated. Again, such a distribution is not now available.

With all these problems in mind, we believe that it would be extremely desirable to test a system through a dry run after the 1977 Budget is submitted rather than proceed as

proposed. In the meantime, I am sure that some information of special concern to the Congress in particular areas of R&D could be provided at the time the 1977 Budget is submitted. I have asked my staff to work with yours to find ways to furnish whatever information is possible.

I would be happy to discuss this matter further with you.

Sincerely yours,

A handwritten signature in black ink, appearing to read "J. Lynn", with a large, sweeping flourish that loops back under the name.

James T. Lynn
Director

OMB DATA PRESENTATION
USING PARTS OF GAO-DEVELOPED CLASSIFICATION STRUCTURE

(Obligations in millions of dollars)	FY	AGRICULTURE		COMMERCE		DE-FENSE		H.E.W.		H.U.D		INTE-RIOR		D.O.T.		ERDA		EPA		NASA		NSF		TOTAL				
		75	76	77	75	76	77	75	76	77	75	76	77	75	76	77	75	76	77	75	76	77	75	76	77	75	76	77
III. ENVIRONMENTAL QUALITY IMPROVEMENT																												
A. Identify Pollutant Effects																												
1. Air	FY 75	65.9	46.3	24.0	1.9	3.7	71.5	19.6	182.3	125.8	46.0	685.9																
	FY 76	83.5	46.7	26.2	1.9	5.3	80.7	17.4	266.8	125.6	51.8	829.7																
	FY 77	80.4	47.3	30.8	1.6	3.7	75.6	17.0	216.4	135.3	55.8	796.6																
	FY 75	38.6		.2	1.6		5.0		62.9	84.3		192.6																
	FY 76	44.6		.2	1.6		4.9		75.8	99.2		226.3																
	FY 77	47.6		.2	1.6		5.2		78.7	90.1		223.4																
	FY 75	2.2							18.8	36.4		49.4																
	FY 76	3.1							18.4	40.3		61.8																
	FY 77	3.4							22.1	37.4		62.9																
2. Water	FY 75	15.9		.2	.6		3.4		5.4	28.6		54.1																
	FY 76	17.8		.2	.6		2.8		7.1	46.6		75.1																
	FY 77	18.9		.2	.6		2.9		9.2	38.6		70.4																
3. Solid Waste	FY 75	2.4							.5	7.5		10.4																
	FY 76	2.7							1.0	2.0		5.7																
	FY 77	3.0							1.3	2.8		7.1																
4. Pesticides	FY 75	18.1			.1		1.6		9.2			29.0																
	FY 76	21.0			.1		2.1		8.7			31.9																
	FY 77	22.3			.1		2.3		10.1			34.8																
5. Noise	FY 75									.2		.2																
	FY 76																											
	FY 77																											
6. Radiation	FY 75				.9				46.2	2.4		49.5																
	FY 76				.9				49.3	1.6		51.8																
	FY 77				.9				46.1	1.2		48.2																
B. Understand Pollution Processes	FY 75	15.1	2.3	1.7	.3		4.5		26.2	38.0	24.7	117.5																
	FY 76	17.4	2.7	1.6			5.2		34.5	56.1	20.0	142.6																
	FY 77	18.3	2.7	1.8			5.4		37.0	40.5	24.9	136.3																
1. Air	FY 75	1.3	.8	1.1			8.1		23.0	21.0		55.3																
	FY 76	1.5	.9	1.0			12.7		33.4	15.4		64.9																
	FY 77	1.6	.9	1.1			15.4		24.4	19.6		63.0																
2. Water	FY 75	7.9	.6	.1			3.0		3.2	15.0	3.7	38.2																
	FY 76	5.7	.7	.2			3.5		3.7	22.7	4.6	49.2																
	FY 77	9.0	.7	.2			3.4		4.0	16.1	5.3	44.4																
3. Solid Waste	FY 75	5.0			.3		.1		.5			5.9																
	FY 76	6.2					.1		.9			7.2																
	FY 77	6.6					.1		1.0			7.7																
4. Pesticides	FY 75	.8					1.4		1.0			2.2																
	FY 76	.9					1.6		1.9			2.5																
	FY 77	1.0					1.9		2.9			2.9																

(Obligations in million of dollars)

	AGRICUL- TURE	COM- MERCE	DE- FENSE	H.E.W.	H.U.D.	R.IOR	D.O.T.	ERDA	EPA	NASA	NSF	TOTAL
5. Noise												
FY 75	.1	.6	.5	-	-	-	-	-	-	-	-	1.2
FY 76	.1	.8	.4	-	-	-	-	-	-	-	-	1.3
FY 77	.1	.8	.5	-	-	-	-	-	-	-	-	1.4
FY 75	-	.3	-	-	-	-	14.4	-	-	-	-	14.7
FY 76	-	.3	-	-	-	-	17.2	-	-	-	-	17.5
FY 77	-	.3	-	-	-	-	16.6	-	-	-	-	16.9
C. Control and Abate Pollutants												
FY 75	11.8	-	19.3	-	3.6	8.6	19.6	8.3	59.3	35.0	-	165.5
FY 76	21.1	-	21.8	.3	4.8	10.8	17.4	12.9	110.6	31.5	-	231.2
FY 77	14.1	-	24.8	-	3.1	5.9	17.0	16.0	85.0	32.9	-	198.8
1. Air												
FY 75	.2	-	.2	-	-	1.3	9.7	2.7	34.3	15.0	-	63.4
FY 76	.7	-	.1	-	.2	7.0	5.0	4.2	68.0	13.5	-	98.7
FY 77	-	-	-	-	.2	2.1	4.0	5.2	44.5	21.2	-	77.2
FY 75	-	-	13.1	-	1.6	6.4	4.3	2.9	21.7	.4	-	50.4
FY 76	6.4	-	16.0	-	2.3	3.0	5.1	4.5	39.4	.7	-	77.4
FY 77	-	-	19.5	-	1.4	3.0	4.0	5.6	34.0	.2	-	67.7
3. Solid Waste												
FY 75	2.4	-	5.1	-	1.4	3.1	2.7	3.1	2.2	-	-	14.9
FY 76	3.9	-	4.8	.3	2.3	-	-	4.2	3.2	.3	-	19.0
FY 77	2.9	-	5.1	-	1.2	-	-	5.2	4.9	.3	-	19.6
4. Pesticides												
FY 75	9.2	-	-	-	-	.9	-	-	-	-	-	10.1
FY 76	10.1	-	-	-	-	.8	-	-	-	-	-	10.9
FY 77	11.2	-	-	-	-	.8	-	-	-	-	-	12.0
FY 75	-	-	.9	-	.6	-	5.6	-	.2	19.4	-	26.7
FY 76	-	-	.9	-	.3	-	7.3	-	-	17.0	-	25.3
FY 77	-	-	.2	-	.3	-	9.0	-	1.6	11.2	-	22.1
FY 75	.4	44.0	2.8	-	.1	53.4	-	.5	.7	67.1	41.3	210.3
FY 76	.4	44.0	2.6	-	.5	59.8	-	.6	.9	74.1	46.7	229.6
FY 77	.4	44.6	4.0	-	.6	59.1	-	1.0	.8	77.5	50.1	238.1
1. Regional Environmental Systems												
FY 75	-	-	-	-	-	-	-	3	.7	-	14.4	15.4
FY 76	-	-	-	-	-	-	-	.3	.9	-	14.0	15.2
FY 77	-	-	-	-	-	-	-	.3	.8	-	12.6	13.7
2. Climate and Weather Study												
FY 75	.4	37.9	2.8	-	-	-	-	.2	-	59.1	16.2	116.6
FY 76	.4	37.7	2.6	-	-	-	-	.3	-	67.2	18.0	126.2
FY 77	.4	37.5	4.0	-	-	-	-	.7	-	74.3	24.3	141.2
FY 75	-	6.1	-	-	-	40.0	-	-	-	-	4.1	50.2
FY 76	-	6.3	-	-	-	46.5	-	-	-	-	5.0	57.8
FY 77	-	7.1	-	-	-	46.5	-	-	-	-	4.5	58.1
4. Disaster and Natural Hazards Studies and Control												
FY 75	-	-	-	-	.1	13.4	-	-	-	8.0	6.6	28.1
FY 76	-	-	-	-	.5	13.3	-	-	-	6.9	9.7	30.4
FY 77	-	-	-	-	.6	12.6	-	-	-	3.2	8.7	25.1

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D. C. 20503

Mr. Harry S. Havens
Director, Program Analysis Division
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. Havens:

This responds to your letter of September 15, 1976 to Director James T. Lynn in which you have asked this office to review a draft report entitled, "Need for a Government-wide Budget Classification Structure for Federal Research and Development Activities." The purpose of this Government-wide effort, as set forth in your letter, is to provide the Congress with Federal research and development budget data in a crosscutting, objective-oriented presentation that supplements existing presentations. The report would recommend that OMB present budget data collected in accordance with the GAO classification structure to Congress as soon as possible after the fiscal year 1978 budget is submitted and that beginning with the 1979 budget, OMB present such data on an annual basis in conjunction with the budget.

Before commenting on specific language in the draft report, I would like to make some general observations about the proposed classification of Federal R&D information as it relates to other budget classification efforts, OMB experience with providing the R&D crosscutting data on the 1977 budget given to Congressional committees early this year, and problems presented by the proposed system.

In our view it is important that the proposed R&D classification structure be looked at in the larger context of other budget classification developments now taking place. For example:

- Subsection 601(i) of the Congressional Budget Act of 1974 requires, beginning with fiscal year 1979, a presentation in terms of (1) a detailed structure of national needs which shall be used to reference all agency missions and programs; (2) agency missions; and (3) basic programs. Formulation of this Government-wide

"national needs" presentation can be expected to have an impact on the presentation of national problems and objectives approach that is implicit in the proposed unified R&D structure. Planning for the subsection 601(i) presentation is going forward and will be accelerated after the 1978 budget is submitted.

- **With respect to the provision of R&D information alone, we have been consulted by a different unit in GAO from years, which is separately conducting studies of how Federal agency R&D budgetary requests would be formulated if certain recommendations (C-2 and C-5) of the Commission on Government Procurement were fully in effect. The tentative recommendations of that unit in GAO involve utilizing agency mission needs to support major system development proposals and related fiscal transactions.**
- **Inevitably, the work by agencies on the 601(i) requirement and the approach of the GAO unit would result in mission structures that differ from your proposed unified R&D structure.**

We believe that it is imperative that the various national needs and mission efforts be rationalized before any one structure is adopted.

As you know, during the 1977 budget season, we undertook the collection and submission of data specifically requested by the House Committee on Science and Technology and the Senate Appropriations Subcommittee on HUD/Independent Agencies. While the proposed GAO classification of Federal R&D programs was used on a limited basis in presenting this data, it was necessary to go beyond the GAO classification system to meet specific needs of the committees. Through a great deal of effort by the agencies and OMB, and in the face of many difficulties, the information was delivered to the Congress. Although there is some evidence that the data were put to use it is not clear how important or critical that data was to Congressional decision making or whether other "packaging" of R&D data might have been more useful. More data are always "desired"--especially when they come as a "free good" to the recipient--but the need and usefulness should be established in cooperation with the Executive Branch agencies listed in Sec. 801 of P.L. 93-344. At least this is our interpretation of that section of the Congressional Budget Act of 1974.

The system further proposed for implementation in the present draft report would require some two dozen agencies to present their research and development budget data each year in accordance with a unified classification structure that comprises 13 major categories, 77 subcategories, and 156 sub-subcategories. This highly detailed presentation would be in addition to the R&D budget submissions made by these agencies to the President and to Congress. We question whether the very substantial investment of agency and OMB resources that your approach would require during the budget season, is desirable.

- Our reservations center on the load of R&D-- and other--budget data that the Congress now must handle, the possible preemption of agency resources needed to carry out the Executive and Congressional review process, and finally problems with the classification itself.
- It is also our view that a mutually exclusive R&D data system such as that proposed not only produces more information than is needed, but in many cases the wrong kind of data. In any such system the choice of where and how to classify activities has to be done in a highly judgmental and arbitrary manner. For example, under the proposed structure, EPA would show its energy-related R&D under "Environment" instead of "Energy." These judgments tend to shift from year to year with changes in R&D emphasis and changes in agency personnel, making it difficult to maintain consistency in the data.
- While research and development budget data must be looked at primarily in relation to agency missions and how much R&D serves the goals and objectives of particular agencies, we recognize that in some instances Congress and the Executive Branch will be concerned about selected problems of a crosscutting nature requiring data from all concerned agencies. An example is information on ozone depletion that was included in the presentation to the Congress earlier this year. As another example, Circular A-11 was revised this year to require across-the-board data on basic research.

- We believe it advisable to tailor detailed data submissions to the specific informational needs of Congressional committees and their staffs rather than developing another overall budgetary reporting system. Our confidence in this approach was reinforced by our submission to the Congress earlier this year. Three of the items requested--ozone depletion, low level pollution, and outer continental shelf--were not identifiable in the proposed GAO unified classification and had to be set out separately.

We believe that a useful course of action would be to develop some limited supplementary R&D data on an interagency basis to cover specific problem areas identified by the Congress, thus avoiding the collection of too much data. Past experience suggests that these needs may well differ from year to year. It is extremely important that in any effort undertaken sufficient time be allowed for planning, agency familiarization, and for thorough review of data submitted. It is also extremely important that the overlap between this GAO proposed R&D structure and the development of other structures--e.g., the 601(i) national needs/agency missions/basic programs presentations--be resolved before adopting any structure.

Pending resolution of the larger issues and information requirements, we will be happy to meet with staffs of key committees and GAO and cooperatively work out specific informational requirements that might be incorporated in planning for the 1979 budget, as well as discussing selected 1978 R&D data requirements that might be submitted to Congressional committees in February.

Specific comments on the draft report are set forth in Enclosure I.

Sincerely yours,

(Signed) Paul H. O'Neill
Paul H. O'Neill
Acting Director

Enclosure

**Comments on GAO Draft Report
Entitled "Need for a Government-Wide
Budget Classification Structure for
Federal Research and Development Activities"**

Chapter 1

Introduction

(See GAO note below.)

Chapter 2

GAO Developed Structure

Page 5 - First full paragraph

(See GAO note.)

The statement is also made that "Possibly as much as \$1.5 to \$2 billion of the projected fiscal year 1977 DOD research, development, test and evaluation budget of approximately \$11 billion is for research and development in areas that have a clear potential to contribute to solving national problems outside of the military mission." The report gives no indication of how this figure was developed or of what elements it is composed.

(See GAO note.)

Page 7 - Second full paragraph

The first sentence reads, "In September 1975, GAO sent the proposed structure to the Office of Management and Budget for implementation." The proposed structure was sent to

(GAO note: Deleted comments relate to material contained in the draft report which has been revised or which has not been included in the final report.)

OMB with a recommendation that agencies be requested to furnish such information in connection with the 1977 budget submission. As mentioned in our letter, we agreed to gather data for two committees utilizing certain categories of the proposed structure.

(See GAO note, p. 50.)

In the same paragraph the statement is made that this test demonstrated that OMB and the agencies are able to familiarize themselves with this system and its definitions, implement the new structure, and present the information to Congress in a timely manner. We disagree. The test demonstrated that a full presentation would require increased agency and OMB budget resources especially during the budget season and that data should be tailored to specific cross-cutting needs.

Page 9 - First full paragraph

We cannot agree that 1978 R&D budget data should be submitted in accordance with the proposed structure. Rather, we believe that we should turn our efforts toward development of some further crosscutting information in connection with the 1979 budget submission. If Congressional committees have a requirement for selected 1978 data, we should arrange to obtain it by February.

Chapter 3

Why a Government-Wide Classification
Structure for Research and Development is Needed

Page 13 - Fourth full paragraph

The statement is made that the information could be used as a preliminary means of identifying agencies which may be able to disseminate information on specific research activities. We should point out that the identification of such information sources is currently facilitated in a number of ways. For example, in the field of energy R&D, the lead agency, ERDA, is already maintaining and reporting across-the-board information on such programs as solar energy. Indeed, ERDA is required to publish a "National

Plan" for energy R&D, and this plan includes descriptions of the major energy R&D related programs of other Federal agencies. The National Science Foundation can assist in locating agencies involved in R&D areas of specific interest, as can the Science Information Exchange.

Chapter 4

Existing Research and Development Presentations

Page 26 - "Specialized Subject Reports" section

The impression is given in this section that the proposed classification will significantly reduce requests for specialized subject reports. On the contrary, the constantly changing character of research and development and the emergence of problems that require tailor made data, make it inevitable that the Congress and the Executive Branch continue to seek answers to questions that require specialized reports.