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THE

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SPRING 1972

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GAO Auditing in the Seventies

This article is based on remarks made by Mr. Staats on October 4, 1971, at the Symposium on Sophisticated Federal and State Government Auditing Techniques sponsored by the Washington, D.C., Chapter of the Institute of Internal Auditors, and on October 12 in Gatlinburg, Tenn., at the Institute of Internal Auditors Southeast Conference on New Developments for Profitable Auditing in the Seventies.

We in the General Accounting Office are constantly striving to expand our capacity to audit the affairs of Federal agencies. As independent auditors in the Federal Government, we are accountable to the Congress for examining into the programs, operations, and financial transactions of all Federal agencies. The challenge of this responsibility is illustrated by the fact that our national budget is now more than double what it was 10 years ago. It now exceeds \$200 billion a year, is continuing to increase, and embraces operations that include in one way or another almost all forms of human endeavor.

After serving more than 20 years in the Bureau of the Budget, I have been concerned for the past 5 years as Comptroller General with advising the Congress on how well the executive branch agencies have spent the money appropriated to them. Some call the General Accounting Office, which I head, the "watchdog for the Congress." Having this responsibility and

having played a personal part—as Deputy Director of the Budget—in assisting four Presidents in the preparation of 14 budgets for the Federal Government, I have—quite naturally—retained an active interest in and concern with the subject of Federal spending.

The Federal Budget

A decade ago, when John Kennedy became President, the Federal budget was approximately \$98 billion. Ten years later, in 1970, the budget had doubled to \$197 billion. The 1972 budget calls for expenditures of \$232 billion. In the 10-year period from 1961 through 1970, we had a budget surplus in only 1 year and had cumulative deficits totaling more than \$60 billion.

The actual deficit for 1971 was \$23.2 billion—sharply upward from earlier estimates, largely because of the downturn in the economy. The President's budget for 1972, submitted last

January, estimated a deficit of \$11.6 billion. Currently the expectation is that the deficit will climb to a much higher figure—some estimate as high as \$25 billion to \$28 billion—primarily due to two considerations: the proposed tax reduction that is a part of the President's new economic program and increases in the President's budget of approximately \$3 billion due to added expenditures to appropriation bills. Thus, there is a possibility that in 2 fiscal years we will add deficits totaling almost as much as those accumulated during the previous 10 years.

The President's 1972 budget requested new spending authority totaling nearly \$250 billion which, added to the \$260 billion authority of previous years, provides the executive branch with spending authority of over \$500 billion to be spent in the years ahead.

The Budget in the Future

The Federal budget for future years is further complicated by the fact that many of our commitments have become "fixed," "built in," or, as some would say, "uncontrollable." To be sure, much of our budget has increased as the result of population growth, inflation, and an increasing number of veterans and of beneficiaries entitled to social security and other pensions.

In transmitting his 1972 budget, President Nixon pointed out that during the next 4 years economic growth should increase Federal receipts by \$86 billion. But, he hastened to add, the built-in or uncontrollable costs in

the budget will limit severely the ability of any President to alter this figure over the next 5-year period. He stated that:

Less than ten percent of the receipts that our current tax system is expected to produce in 1976 will be available for all the new programs to be introduced between now and then.

GAO's Responsibilities

Federal laws governing the responsibilities and work of the General Accounting Office not only permit but *require* us to examine into the manner in which Federal agency managements discharge their responsibilities for using Federal resources. We consider the financial management responsibilities of Federal agencies to include the administration of funds and the utilization of property and personnel for authorized programs, activities, or purposes in an effective, efficient, and economical manner.

Our audit mission requires us to:

- Emphasize any aspects of the administration of programs or activities by Federal agencies that seem to require correction or improvement.
- Emphasize the ways, means, and methods most likely to achieve necessary correction or improvement.
- Concentrate as much as possible on those programs or activities which seem most important from the standpoint of size and other factors and which appear to present opportunities for increased efficiency and economy and for

improvements in operations and management controls.

In selecting areas for review, we give primary attention to those areas known or considered to be of direct interest to the Congress or which, in our judgment, should be reviewed by an independent audit arm of the Congress. The important factors we consider in reaching decisions on the allocation of audit effort are:

- Specific statutory requirements.
- Expressions of congressional interest; e.g., views contained in committee reports.
- Importance of programs or activities judged by such measures as the size of expenditures, public impact, investment in assets, and amount of revenue.
- Criticisms indicating potential needs for corrective action.

GAO Reports

Reports of the General Accounting Office cover subjects ranging from uses made of foreign currency, military and economic assistance, urban renewal programs, public housing, space exploration, atomic energy programs, anti-poverty programs, and education and manpower development and training programs, to the procurement, production, and operation of major weapon systems in the Department of Defense. Each year the General Accounting Office sends some 200 audit reports to the Congress. These are also available to the public, unless classified for security reasons. In addition, it makes many more reports to committees or

Members of Congress. There were nearly 300 of these last year. Finally, many reports dealing with matters of less significance go to agency officials. Over 500 reports of this type were prepared last year.

A large number of the reports sent to the Congress and to heads of executive agencies deal with substantive matters of Federal agency planning and performance pertaining to a wide diversity of missions and programs.

Importance of Internal Auditing

Since the 1940's, internal auditing has made great progress in the Federal Government. Thirty years ago few Government agencies in the United States had any internal audit functions. By contrast, today nearly all Government agencies have internal audit organizations. Agency managers have come to rely upon internal audit as a source of information and assistance in improving operations, and the Congress has officially endorsed it in the enactment of various laws.

We consider a strong internal audit system to be an essential part of a Federal agency's management control system. Thus, over the years, we have strongly supported efforts for strengthening this function in Federal agencies. We first issued a statement of concepts and principles on internal auditing in 1957. In 1968, a complete revision was published and was widely distributed to Federal agencies.

The revised guidance statement, which reflects the collective wisdom and experience of personnel of the General Accounting Office, Federal de-

partments and agencies, and representatives of public accounting firms and industrial organizations, places great emphasis on the usefulness of internal auditing to strengthen management systems and on the very essential role the heads of Federal agencies must play to make internal audit systems function effectively.

I would also like to mention the revised statement of responsibilities of the internal auditor recently published by The Institute of Internal Auditors. This second revision summarizes in an agreeably short document the essence of internal auditing. It is very much in line with the growing stature of the internal auditor as an important part of any organization's management system.

The General Accounting Office makes every effort to keep abreast of the planned work programs of Federal agency internal auditors, to consider them in planning its own work, and to avoid, wherever possible, conflicts in audit schedules. We try to familiarize ourselves also with the work of other internal review groups which may have examined into operations or activities that we are interested in.

Coordination and support of strong agency internal auditing are of twofold importance:

—*First*, to the General Accounting Office because, in fulfilling its responsibilities to the Congress, it is required to examine into the effectiveness of agency internal audit activities and to give due regard to internal audit coverage in carrying out the audit activities of the Office.

—*Second*, to agency heads because internal audits and appraisals keep agency management informed of what is happening at the point of operation. Internal audit is an integral part of an agency's system of management control.

Audits of Program Results

The increased emphasis now being given by GAO to auditing program results originated many years ago. This work involves examining into the accomplishments, benefits, or achievements of Government programs and considering whether the objectives established for them are being achieved.

This further extension of our audit work is now specifically directed by law as a result of the enactment of the Legislative Reorganization Act of 1970. Section 204 of that law directs us to review and analyze the results of Government programs and activities carried on under existing law, including the making of cost-benefit studies when ordered by either House of Congress, when requested by any committee having jurisdiction over such programs and activities, or *upon our own initiative*.

A good example of how the Congress is tending more and more to look in our direction for information on how Federal programs are really working occurred on the floor of the Senate recently. During a discussion of the National School Lunch program, Senator Dole of Kansas stated:

There has been a suggestion that perhaps the General Accounting Office should look

into this entire program, to see whether it is being properly administered in the States, to see whether the funds are being properly expended in the States, and to see whether we might modernize and bring the program up to date. I feel, and I know that there are other Senators who also feel that perhaps, as we continue to add and add and add, we should take a good, long look at the total program, whether it be section 4, section 11, or the special section 32 funds. I believe that some of us will be pursuing this effort to determine: Are the funds being properly spent? Are they going to the children who should have these free and reduced price lunches? To me, that is the important question.¹

At this point, I would like to summarize the principal factors which have affected the extent and rate with which this change in emphasis in our audit work has taken place.

- Performance of audit work at agency sites has provided GAO staff members with great familiarity with agency program operations, thereby helping us to know what is going on. It has enabled the auditors to identify agency operating programs needing more detailed review and having possible interest for the Congress.
- Agency internal management controls and systems have been strengthened with the result that the General Accounting Office has been able to place greater reliance on agency internal audits and management reviews. This has lessened the need for us to apply our resources to the audit of routine fiscal transactions.
- Staff members of the General Accounting Office have developed

increased competence and detailed knowledge of Federal programs through long experience. Increased capability has also come from major investments in training and, more recently, through recruitment of staff members and consultants with expertise in a variety of disciplines.

- Requests from committees of Congress for assistance, either for assignment of staff members or for the conduct of specified studies, have increasingly emphasized the desire for studies of program effectiveness.

Objectives of Program Results Audits

In making examinations of program results, we seek answers to at least these seven questions:

1. Is the agency program achieving the results intended as specified in the legislation or in the implementing directives of the agency and within the costs anticipated at the time the legislation was enacted?
2. Is the agency program or activity being conducted and are expenditures being made in compliance with requirements of applicable laws and regulations?
3. Does top agency management have the essential information to exercise supervision and controls and to ascertain directions or trends?
4. Does agency management have adequate internal review or audit facilities to monitor program operations, to identify management

¹ *Congressional Record*, Oct. 1, 1971, p. S 15652.

problems and weaknesses, and to insure fiscal integrity?

5. Are there overlappings of jurisdiction and duplications of effort which serve no useful purpose?
6. Have alternative programs or procedures been examined by agency management or should they be examined for potential in achieving objectives with the greatest economic efficiency?
7. Where alternatives have been considered, were studies, such as cost benefit studies, made to support executive branch proposals adequate from the standpoint of analyzing costs and benefits of alternative approaches?

The ability to relate the effectiveness of operating programs to legislative objectives depends in large part upon how specifically the legislation sets forth these objectives, either in the legislation itself or in the accompanying legislative history. For example, the Public Works and Economic Development Act of 1965 is quite general in its statement of purpose and avoids specific earmarking of funds. On the other hand, much of the housing legislation of the Congress is quite detailed in specifying the type of assistance authorized and in designating funds for each purpose.

Some Examples of GAO Audits

So far I have been talking largely in generalities. In practice, these generalities are translated into specific audits or reviews and reports to the Congress or to agency officials. Before concluding,

I would like to give you a sampling from some of our recent congressional reports to illustrate the nature of findings reported, the diversity of subject matter, and our version of the expanding usefulness of the auditor to improved governmental management and operation.

Recreational Projects Financed by Farmers Home Administration Provide Benefits to a Limited Number of Rural Residents (Department of Agriculture, B-114873, Aug. 23, 1971)

GAO is recommending that the Congress, in its continuing evaluation of Farmers Home Administration programs, consider matters discussed in this report with a view to determining whether FHA recreational loan programs should be continued and, if so, what form the programs should take.

Types of recreational projects for which loans may be made under these programs include golfing facilities, lakes, swimming pools, rodeo arenas, and baseball diamonds. Through December 31, 1969, FHA loaned \$98.1 million for these purposes. Many loans provided benefits to a limited number of rural residents and in many instances did not contribute effectively to providing rural residents with outdoor recreational projects—the program's objective.

Development of Minority Business and Employment in the Hough Area of Cleveland, Ohio, Under the Special Impact Program (Office of Economic Opportunity, B-130515, Aug. 17, 1971)

As of February 1971, after more than 2½ years of Federal funding, OEO's Special Impact program carried out by the Hough Area Development Corporation in Cleveland had brought few visible benefits to Hough. Considering Hough's deep-seated and long-standing problems of unemployment, poor housing, and high crime rate, however, it

would be unrealistic to expect a major social and economic impact in that short a time.

Hough Development leaders have shown a willingness to recognize their errors and have attempted to correct them. GAO believes that they have learned that complex programs require planning not only of what to do but also of how to do it. If the Special Impact program in Hough is to succeed, it must maintain the support of the Hough community. To this end Hough Development must soon demonstrate that it can produce successful projects which will provide tangible benefits to the community.

Assessment of the Teacher Corps Program at the University of Southern California and Participating Schools in Tulare County Serving Rural-Migrant Children (Office of Education, Department of Health, Education, and Welfare, B-164031(1), Aug. 25, 1971)

The USC rural-migrant program strengthened educational opportunities available to Spanish-speaking children in the schools where corps members were assigned. The USC program was successful also in broadening the University's teacher preparation program.

USC established a special curriculum for the interns designed to develop their proficiency in Spanish and sensitivity toward the learning problems of Spanish-speaking children of rural-migrant families. The program was USC's first attempt to train teachers for children of rural-migrant families.

Need for Improving the Administration of Study and Evaluation Contracts (Office of Education, Department of Health, Education, and Welfare, B-164031(1), Aug. 16, 1971)

The use of contractors by the Office of Education to conduct studies and evaluations has increased substantially over the years. The studies are performed by public or private agencies, organizations, groups, or individuals. This report illustrates the need

for the Office of Education to improve its administration of contracts so that maximum benefits can be realized from funds expended.

Savings Available Through a Government-Wide Program To Rehabilitate Instrumentation Tape (General Services Administration, B-164392, Aug. 23, 1971)

This report informs the Congress of the potential for significant savings through the establishment of a Government-wide rehabilitation program for instrumentation tape—a type of magnetic tape used by Federal agencies to record data used in scientific projects—and of the pertinent actions planned by the General Services Administration. The Government's cost of procuring this tape is estimated at \$10 million annually.

Too Many Crew Members Assigned Too Soon to Ships Under Construction (Department of the Navy, B-172632, Aug. 9, 1971)

The Navy assigns nucleus or skeleton crews for temporary duty periods up to 6 months to ships under construction to insure delivery of ships with trained, well-organized crews. GAO questioned whether crews so assigned were being used efficiently and reviewed crew assignments for five of these ships. This report shows that the Navy can provide a means for better use of manpower resources if it limits the assignments of nucleus crews to the minimum size and composition needed to fulfill their mission and also reduce per diem costs.

Need To Increase Rates To Recover the Cost of Providing Service to Commercial Firms Renting Multiple Post Office Boxes (U.S. Postal Service, B-114874, July 19, 1971)

The cost of providing service to commercial firms renting multiple boxes exceeds the revenues provided from rental fees. The

Postal Service has acknowledged the need for modifying the rental policy for multiple boxes to recover the costs of providing service to such boxes.

Improvements Needed in Management of Projects To Develop Business Opportunities for the Poor (Office of Economic Opportunity, B-130515, July 20, 1971)

Through the creation of new business opportunities for the poor in ghetto and rural areas, the Office of Economic Opportunity is attempting to innovate and develop new ways to help the poor to become self-sufficient. This report informs the Congress of the problems which have arisen in the administration of this program and demonstrates the need for greater use of private enterprise and better cooperation between Federal agencies in carrying out this program.

Further Improvements Needed in Administration of the Small Business Investment Company Program (Small Business Administration, B-149685, July 21, 1971)

This report highlighted various problems in regulating the Small Business Investment Companies, which use Federal funds to make long-term loans to small business concerns to stimulate and supplement the flow of private equity capital. The Congress may wish to consider the feasibility of providing the Small Business Administration with the legislative authority to impose fines against SBICs which fail to correct violations.

Improved Controls Needed Over Extent of Care Provided by Hospitals and Other Facilities to Medicare Patients (Social Security Administration, Department of Health, Education, and Welfare, B-164031(4), July 30, 1971)

Medicare payments for care provided by hospitals and extended care facilities increased from \$2.5 billion in fiscal year 1967

to \$4.7 billion in fiscal year 1970. This report is concerned with the effectiveness of procedures established to control the extent of care provided to Medicare patients in hospitals and extended-care facilities. GAO was assisted in its evaluation by consulting physicians.

The Medicare law requires that each hospital and extended-care facility establish a committee, consisting of at least two physicians, to review the medical necessity of admissions, duration of stays, and professional services rendered.

HEW agreed with GAO's finding that there was a need for SSA, State agencies, and intermediaries to take additional practical measures to foster the role of review committees. HEW outlined several actions which it had taken or proposed to take to improve the review function. HEW officials estimated that, as a result of such actions, Medicare costs in fiscal year 1972 would be reduced by about \$60 million.

Better Cost Accounting Needed for Operation and Maintenance of Military Family Housing (Department of Defense, B-159797, July 2, 1971)

In 1962 the Department of Defense developed cost accounting procedures for operation and maintenance of military family housing. A GAO review of these procedures showed that the Secretary of Defense should consider establishing new categories of housing to provide data more nearly comparable and useful for cost management; issue more comprehensive directions to insure greater uniformity in recording and reporting of costs of operation and maintenance; and provide the Congress with a plan for orderly replacement of family housing units no longer economical to operate and maintain.

I cite this last report to illustrate that we do not overlook the contribution that good accounting systems can make to better management. Effective

accounting systems are a statutory requirement for all Federal agencies. GAO has the job not only of prescribing broad principles and standards to be followed, cooperating in accounting systems development, and approving systems designs, but also of monitoring such systems in operation.

Scope of Governmental Auditing

It is my belief that the responsibility of the independent, external governmental auditor should embrace the following three aspects of management accountability:

- Fiscal accountability*, which includes fiscal integrity, disclosure, and compliance with applicable laws and regulations.
- Managerial accountability*, which is concerned with the efficient and economical use of personnel and other resources.
- Program accountability*, which is designed to assess whether programs are achieving their intended objectives and whether the best program options have been selected to achieve these objectives from the standpoint of total cost and outputs.

An accountability system should embrace all three elements. There must be public confidence in fiscal integrity in the spending of public funds; there must be assurance that waste does not occur through mismanagement; and there must be an assessment of whether programs are accomplishing their intended objectives with due regard to costs and results.

Auditing Standards

Before concluding, I should mention the project GAO is leading to develop more comprehensive auditing standards for the audit of Federal assistance programs.

This is a vast area of expenditure. Federal aid to State and local governments is budgeted at over \$38 billion for the current fiscal year. The need for better understood standards governing the audit of these programs is great, irrespective of who makes the audit.

We have been working with representatives of other Federal agencies, State and local governments, and a number of professional associations and public interest groups to develop these standards. A working draft of the standards was recently widely distributed for review and comment.

Because governmental administrators and legislators need independently evaluated information about government programs, the proposed standards go beyond the so-called generally accepted auditing standards of the independent public accountant. Generally accepted auditing standards were developed for application to audits having as their main objective the expression of an expert opinion on financial statements. These are all right as far as they go but they do not go far enough to be fully useful in audits of governmental programs and activities.

As I have already indicated, we favor a concept of auditing that embraces three broad elements of accountability—fiscal, management, and

program. The audit standards project is important in its own right but an additional reason for mentioning it here is that the standards we are proposing contemplate a scope of auditing that will embrace these same three broad elements of accountability.

Concluding Remarks

In summary, I do not intend to imply that the auditor has an exclusive responsibility for management and program evaluation. Other analytical staffs and other systems of review are also available to government administrators and legislators. Too frequently, however, such staffs have been primar-

ily concerned with budget formulation and program planning and not sufficiently with whether authorized programs are achieving their intended results. This is the area to which I strongly believe the auditor has a major and increasingly important contribution to make. He has a tradition of making and reporting his findings independent of operating officials. He should be increasingly equipped with special skills which go far beyond that required for financial audits alone. And most importantly, he should be increasingly looked to by legislatures and by executive officials for examinations and recommendations on all three aspects of accountability.

Need for GAO Audits

* * * we need the kind of audits and evaluations by GAO that will enable Congress to feel confident that it is using its oversight function to improve program performance in the Executive Branch as well as to improve its own performance in the authorization and appropriation process. This, to me, is one of the major challenges to the GAO in its second 50 years.

James E. Webb

Former Administrator of NASA.

Speaking on "Leadership Evaluation in Large Scale Efforts" during the GAO 50th anniversary lecture series, September 17, 1971.

Utilizing Engineering Principles in Auditing

This article discusses a developing approach to auditing in the GAO which incorporates industrial engineering principles.

In its auditing GAO is progressively employing a systems approach, that is, looking at an organization's overall performance, by combining industrial engineering principles with traditional audit practices. This interface of two disciplines, engineering and auditing, is proving to be a "giant step" in GAO's progress. To understand the responsibilities of industrial engineering and to be able properly to evaluate them is to better comprehend the sources of many of our audit problems relating to cost, performance, and schedule. For areas of responsibilities of industrial engineering see figure 1.

The responsibility of industrial engineering is to translate an approved design into production hardware, the result of which directly determines the effectiveness and efficiency of the production program. This responsibility includes selection of materials, processes, machine tools, machine loading, and development of labor stand-

ards—functions that are essential to the quality, reliability, production rate, and cost of the finished product. Program management, operations, and financial management must, in fact, rely on industrial engineering decisions to attain their objectives. Many programs, including those employing sophisticated management techniques (such as cost/structure breakdown), are susceptible to early assessments by using industrial engineering data in comparability studies.

In his paper, "Management or Operational Auditing," presented to the 7th International Congress of Supreme Audit Institutions and reprinted in the Winter 1972 issue of *The GAO Review*, Comptroller General Elmer B. Staats defined the total audit job as consisting of financial auditing, management auditing, and program auditing. Such a complete audit, he said, "could be considered a comprehensive audit of an organization's overall per-

Mr. Marks is an industrial engineer in the Defense Division's Special Projects Group. He is a graduate of the University of Detroit and a registered professional engineer. He has had considerable engineering experience in both private industry and the Federal Government. He joined the General Accounting Office in August 1969 after extensive experience in the Department of Defense and the Federal Aviation Agency.

FIGURE 1

AREAS OF RESPONSIBILITIES OF INDUSTRIAL ENGINEERING

| FUNCTIONS | MAJOR APPLICATIONS |
|-------------------------------------|-------------------------|
| METHODS: | INDUSTRIAL PLANTS |
| METHODS ENGINEERING | WAREHOUSES |
| OPERATION ANALYSIS | SHIPYARDS |
| MOTION STUDY | BANKS |
| MATERIALS HANDLING | INSURANCE COMPANIES |
| PRODUCTION PLANNING | HOSPITALS |
| SAFETY | CONSTRUCTION PROJECTS |
| STANDARDIZATION | MINING |
| WORK MEASUREMENT: | AGRICULTURE |
| TIME STUDY | R. & D. |
| PREDETERMINED ELEMENTAL | LIBRARIES |
| TIME STANDARDS | POST OFFICE |
| CLERICAL PROCEDURES | DEPOTS |
| WAGE PAYMENT: | GOVERNMENT AND MILITARY |
| WAGE INCENTIVES | AEROSPACE |
| PROFIT SHARING | TRANSPORTATION |
| JOB EVALUATION | CONSUMER SERVICES |
| MERIT RATING | AIRLINES |
| WAGE AND SALARY ADMINISTRATION | |
| CONTROLS: | |
| PRODUCTION CONTROL | |
| INVENTORY CONTROL | |
| QUALITY CONTROL | |
| COST CONTROL | |
| BUDGETARY CONTROL | |
| PLANT FACILITIES AND DESIGN: | |
| PLANT LAYOUT | |
| EQUIPMENT PROCUREMENT AND | |
| REPLACEMENT | |
| PRODUCT DESIGN | |
| TOOL AND GAUGE DESIGN | |
| OTHER: | |
| INDUSTRIAL RELATIONS | |
| SUGGESTION SYSTEMS | |
| MANAGEMENT RESEARCH | |
| PREPARATION OF OPERATING | |
| AND MAINTENANCE MANUALS | |

formance.” He further observed that the expanding role “of the independent, external governmental auditor should embrace the following three aspects of management accountability: Fiscal * * * Managerial * * * Program accountability.” This threefold accountability is definitely inherent in the industrial management reviews currently being made by GAO at contractor plants and selected industrially funded Government facilities.

Need for More Inclusive Audits

Severe financial difficulties in current defense programs, mounting public criticism, and substantial cutbacks in new development programs suggest very strongly a need for more inclusive audits of organizations’ overall performances. The Congress, in fact, has been giving more attention to and is more critical of Department of Defense procurement. This attention and criticism may well stem from two basic facts: (1) approximately \$24 billion or 75 percent of the defense procurement dollar is expended on major weapon systems and (2) these dollars are contractually committed on a sole-source, noncompetitive, negotiated basis.

When true competition is available, the Government can rely on the free forces of the marketplace to assure fair and reasonable prices. The Government, however, can have little assurance that today’s prices are fair and reasonable from a competitive standpoint when contractual practices commit such an extremely large amount of defense procurement dollars

on a sole-source, noncompetitive, negotiated basis. Since new weapon systems are always pushing the state-of-the-art, configuration, performance, and costs are constantly changing. These changes, of necessity, reduce the reliability of the historical costs traditionally used in estimating expenditures for new systems. These variables give rise to the need for the application of all-inclusive management reviews as a reliable method of identifying and measuring the impact of the technological breakthroughs on configuration, performance, and cost of a system.

Nature of Industrial Management Review

The industrial management review currently performed by GAO involves an examination and evaluation of all phases of a contractor’s operation, including program, financial, engineering, and operations management. The primary objective is to identify instances of omission or commission in the planning, direction, control, or administration of work under selected Government contracts—instances which compromise attainment of realistic cost, schedule, and performance objectives.

This management review will provide visibility of actual performance against the job to be done, including the identity of resources actually being consumed or used. This will permit management assessment of effectiveness and efficiency of performance; that is, a comparison of programmed versus actual performance. Further, it

will provide the basis for recommending management improvements.

These omissions or commissions may be attributed to the military department (system program office), the contract management team, or the contractor's internal management. In accomplishing the primary objective of this review, it is not sufficient merely to identify areas needing attention but it is essential that the potential benefits of the management improvements be quantified whenever possible. For example, in one contractor's plant a review team analyzed in detail the test procedures and results of the firm's inspection program and determined that more flexible test procedures were needed. Both the contractor and Government quality assurance representatives concurred in the findings, and, as a result, a lot-sampling procedure was adopted in place of a 100-percent inspection, with a potential annual saving of \$1.1 million.

Some recommended management improvements may be relatively easy

to effect, with the resultant savings quickly realized; others may be more difficult to achieve and, for this reason, are more properly categorized as long-term benefits. Nonetheless, in both the short and the long term, benefits will be realized on follow-on contracts, since the improvements relate to the Government/contractor operations and these are not limited to any specific contract.

As indicated, the scope of this total functional audit includes four major areas of a contractor's organization: program, engineering, operations, and financial management. The specific functions to be considered within these principal areas are shown in figure 2. An in-depth review of each of these functions, however, is not necessary since the preliminary survey should adequately identify the areas with the greatest potential in terms of management improvements and cost reduction.

This industrial management review concept recognizes the interaction of managerial functions—program, engi-

FIGURE 2

SCOPE OF INDUSTRIAL MANAGEMENT REVIEWS

| PROGRAM MANAGEMENT | ENGINEERING | OPERATIONS | FINANCIAL |
|---|---------------------------------|----------------------------------|-----------------|
| OBJECTIVES | DESIGN/SYSTEMS ENGINEERING | MANUFACTURING | PRICING |
| PROGRAM CONTROL | RELIABILITY/ MAINTAINABILITY | MATERIAL/PRO- DUCTION CONTROL | COST ESTIMATING |
| CONFIGURATION MANAGEMENT | INDUSTRIAL ENGINEERING | PROCUREMENT | ACCOUNTING |
| CONTRACTS | STANDARDS ENGINEERING | LABOR STANDARDS | BUDGET |
| SUBCONTRACT MANAGEMENT | TEST ENGINEERING | QUALITY ASSURANCE | |
| DATA MANAGEMENT | | | |
| COST/SCHEDULE/ CONTROL/ SYSTEM (CSCS) | | | |

neering, operations, and finance (see figure 3)—and thereby differs basically from the traditional financial audit by examining into the contractor's mode of operation, management, and production practices which are the factors that generate the costs. This type of review continues to utilize traditional concepts of price-proposal evaluation and also includes evaluation of such factors as plant layout, labor standards, material/production control, quality assurance, manufacturing practices, and configuration management. In effect, the more inclusive management review **INTEGRATES** and **ORCHESTRATES** the traditionally separate financial, managerial, and program audits with the engineering discipline. In a word, a more realistic and accurate picture of a contractor's performance is thereby obtained because it makes visible the interplay among the functions. It should also be pointed out that while the immediate opportunity for the Government to benefit from the application of this type of review is through its use in the preaward evaluation of a contractor's proposed price, GAO recognizes that these concepts can also be beneficial to both the contractor and the Government in a postaward evaluation of a contractor's performance.

Team Approach to Industrial Management Reviews

The management review team engaged in this study should, as a minimum, include personnel with experience in industrial engineering (pro-

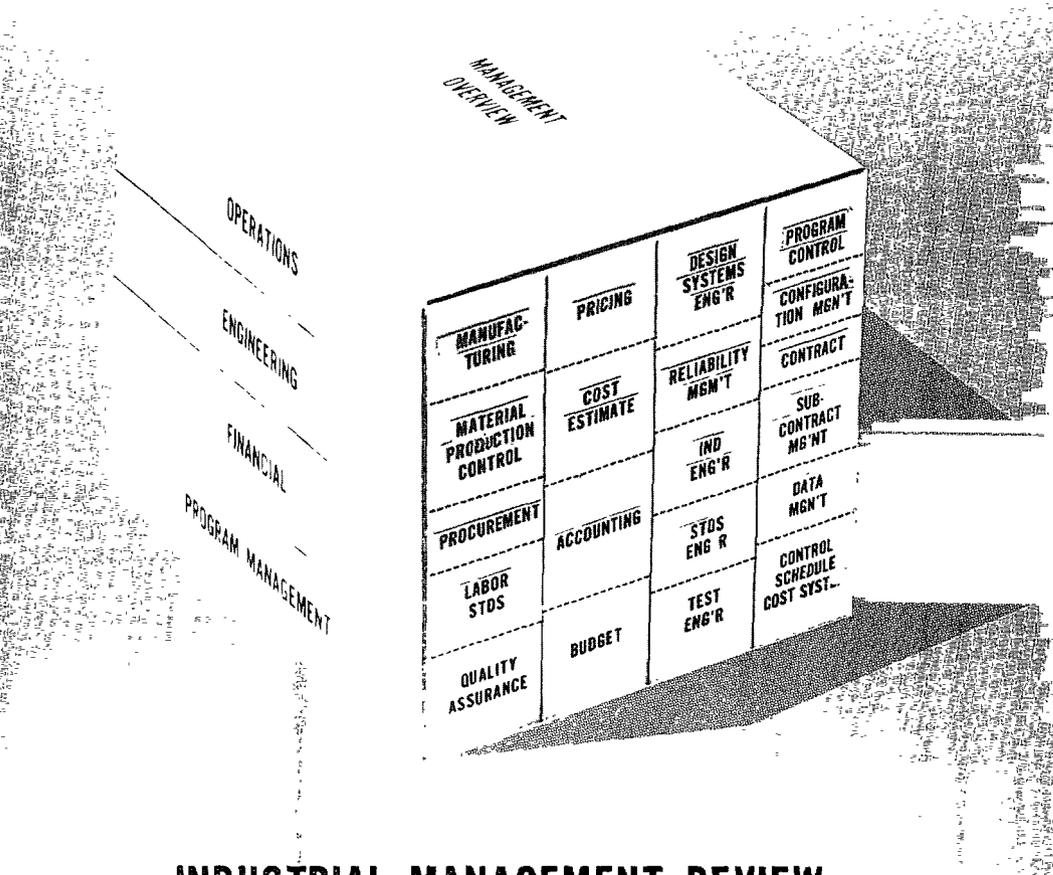
duction methods, labor standards, configuration management, etc.) pricing, procurement procedures and regulations, organization and management, and audit techniques. Since, however, GAO has limited expertise in some of these areas, an overriding consideration must be the motivation and dedication of the auditors assigned to this review. Those who approach the task with a preconceived notion of undertaking just another pricing review are not likely to constructively analyze the contractor's overall operations or the Government's contract administration practices. On the other hand, those individuals who are objective, who possess creative ability, and who are self-starters are best suited for this type of a review.

To make more effective use of the specialized disciplines essential to this type of management review, GAO is developing a Washington-based cadre to provide the regional offices with the necessary training, direction, and ongoing consultation in the specialized fields of industrial engineering and program management.

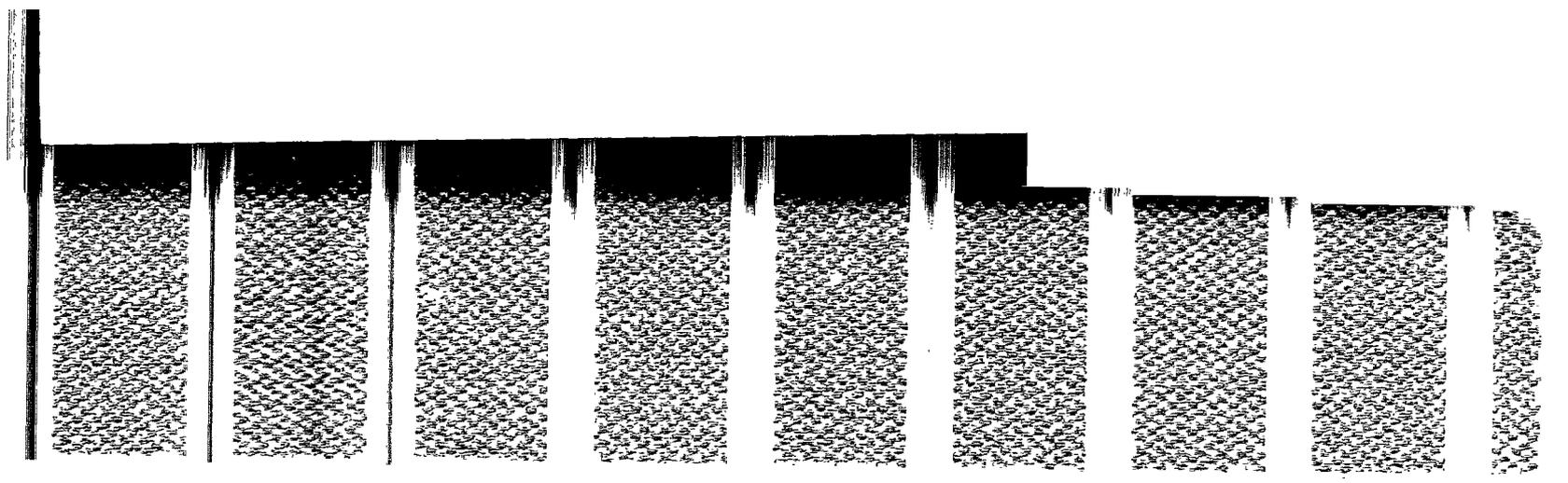
Importance of Cooperation

To encourage cooperation on the part of the contractor, every effort is made during the review to be open and frank with the contractor's management personnel. Periodic meetings are held with top and middle management to keep them informed of the findings and advise them of any problems. These meetings are intended to give all concerned a better understanding of the areas under review and to encour-

FIGURE 3



**INDUSTRIAL MANAGEMENT REVIEW
FUNCTIONAL AREAS INTERACTION**



age contractor management to consider and be responsive to the findings as they are developed.

Scope of an Industrial Management Review

During the survey phase of the industrial management review, it is determined which of the principal areas of organization, program management, engineering, operations, and finance should be reviewed in depth. To illustrate the penetrating look given these areas, program management and engineering have been selected to typify this approach.

Program Management.—In our appraisal of the Government/contractor program management procedures, the review team is alert to a number of areas where management improvements might be made and cost savings realized, as:

- Program flexibility
- Cost control
- Timely decisionmaking
- Responsibility assignments
- Directives
- Program interface and program integration
- Specifications

While the effect on cost of one or more of these areas is self-evident, estimates of the savings resulting from management improvement may be difficult. Particular attention is given to identifying the following conditions on which improvements will result in quantifiable cost savings:

- Duplication of effort

- Idle time resulting from slippage of internal schedules
- Rework and redesign resulting from incomplete design and/or specifications
- Delays due to lack of accomplishment of program elements
- Unsatisfactory vendor parts and/or material
- Incompatibility of subsystems
- Degradation of performance
- Slippage of system schedules

Engineering. — In determining whether the contractor's design/systems engineering effectively incorporates operability, producibility, maintainability, and reliability into product design, we review and assess the adequacy of the total engineering effort. Although engineering functions differ in the type of technical talent required in their performance, much of their efficiency will be dependent on the expertise of management and the type of work/schedule control system that is used to administer and evaluate individual and group performance. It is equally important that we review not only the tasks which are performed and the efficiency with which they are performed but also determine how essential the tasks are to the total program. Elimination of unnecessary, unproductive engineering efforts can, and often does, reduce costs substantially.

GAO's Current Industrial Management Review Activities

In May 1969, the Subcommittee on Economy in Government, Joint Economic Committee, recommended that

GAO study the feasibility of incorporating the concepts of this approach into its audit of contractor performance.

In our May 1970 report to the Congress (B-159896), we concluded that it was feasible for GAO to use this approach and that we planned to make a trial application to test this approach. The results of our trial application were reported to the Congress on February 26, 1971 (B-159896). Our report cited a number of areas where increased management attention by the contractors could result in lower cost to the Government. We also pointed out instances where Government contracting or administration practices adversely affected contract costs.

Currently, several industrial management reviews are being performed at contractors' plants and at industrially funded Government facilities. The value of the approach continues to be demonstrated in terms of potential savings accruing from the review team's recommended management improvements. For example, a GAO investment of \$83,000 in an industrial management review netted a return of \$12 million potential annual saving through management improvements and a potential saving of \$100 million in excess inventory. Another GAO review cost about \$70,000 to develop a potential annual saving of \$2.8 million, or about 10 percent of the contractor's net sales. In a third instance, a GAO finding that some \$1.2 million in a contractor's operating costs was due directly to the fact that 72 percent of the Government-owned machine tools were totally inefficient by reason

of age and condition led to the replacement of this equipment by the Defense Industry Production Equipment Center. It is important to realize that all unnecessary contract costs are not the fault of the contractor as demonstrated by the last example.

Over and above the benefits shown in the few examples cited, GAO is conducting these management reviews for additional reasons. GAO is called upon by the Congress to conduct followup reviews of Department of Defense industrial management studies in order to (1) determine the nature and extent of the potential savings identified by the Department's studies, (2) determine the resulting benefits obtained by negotiation of reduced contract prices, and (3) assess the continuing efforts by both the contractor and the Government to realize the long-term potential benefits identified by the Department's studies. Further, these reviews provide GAO with an abundance of meaningful and convincing data with which to encourage and persuade the military services to conduct such management reviews in the prenegotiation phase of all sole-source, noncompetitive contracts, to the extent of available resources.

Additionally, it is our objective to collectively analyze the findings of the Department of Defense and GAO industrial management reviews and identify those problems that are common to a majority of contractor organizations which can be corrected or minimized by sound contractual changes. Such corrective action would affect other contractors doing business with

the Government who possibly would never be subjected to industrial management reviews due to the limited available resources to conduct such reviews.

The timeliness and need for this systems approach to auditing is supported by the January 13, 1972, issuance of the DOD Directive 5010.15, "Defense Integrated Management Engineering Systems," which has the following stated objectives: (1) improve labor productivity through application of management engineering principles and techniques and (2) provide a

common base of work measurement and productivity data which can be used in the development of budget estimates and manpower requirements, in work planning and control, in the development of productivity performance indexes relating outputs to inputs, and for other management purposes.

The better GAO understands the causes of the problems relating to cost, performance and schedule, the more constructive its recommendations to the Congress and the departments and agencies concerned with resolving these problems are likely to be.

Let us recognize that the only thing demeaning in America is for one man to refuse to work and to let another man who does work pay taxes to keep him on welfare.

President Richard M. Nixon

Speaking at the AFL-CIO Ninth Constitutional Convention, Bal Harbour, Fla., November 19, 1971.

721517

Delphi—Systematic Opinion-Gathering

As the General Accounting Office devotes increasing attention to evaluating the results of Government programs, it seems likely that greater reliance will be placed on the collective judgments or opinions of experts both within and outside the Office. This article discusses an emerging tool for obtaining and using such opinions.

Opinion has long been a subject of interest to the auditor. As related to the portion of his work concerned with reporting on the financial condition of a corporation or other entity, the auditor's opinion has a highly formal and precise significance. In other aspects of his work, although of perhaps less formal significance, opinion is nonetheless a present and important element, be it his own or that of someone whose efforts are being audited. This article discusses an aspect of opinion that has probably been of less importance to the auditor in the past than it will be in the future, namely, that of the collective opinion of a group of people having knowledge relevant to a specific question. More specifically, as the title implies, this article is a discussion of Delphi, a name given to a method of eliciting and refining the opinions of a group of people usually referred to as experts.

Origin

Delphi originated in the early 1950's at the RAND Corporation, Olaf Helmer and Norman Dalkey having received major credit for its development. The name Delphi¹ was coined by Abraham Kaplan, a philosopher who coauthored the original paper in the area in 1950.²

In its circa-1950 form, the work at RAND in the field of opinion-gathering was primarily concerned with improving the use of group information. In 1953, Dalkey and Helmer introduced a new feature to the process of eliciting the information, and it was this innovation that came to be known as Delphi. The feature added by

¹ The name refers to the ancient Greek town where the oracle of Apollo was consulted regarding the future. The name was chosen because the technique was originally thought of as a forecasting method.

² A. Kaplan, A. Skogstad, and M. A. Girshick, "The Prediction of Social and Technical Events," *Public Opinion Quarterly* (Spring, 1950), pp. 93-110.

A previous contributor to *The GAO Review* ("Weapon Systems Cost-Effectiveness Studies," Spring 1971), Mr. Wright is an operations research analyst in the Division of Financial and General Management Studies.

Dalkey and Helmer was iteration with controlled feedback, or stated another way, requesting each respondent's opinion not once, but several times, with each respondent each time being given a summary of the group's previous answers and thus an opportunity to reconsider and possibly revise his previous response.

Rationale

Delphi has been developed as, among other things, an alternative to the committee or face-to-face discussion method of arriving at a group opinion. Dalkey cites three major difficulties presented by the group discussion approach as disclosed by RAND experiments.

In these experiments, some of the biasing effects that have stood out are: (1) The influence of dominant individuals. Often, the group opinion is essentially determined by the opinion of the individual who talks the most, and there is little relation between volubility and ability. (2) Noise. A group is a social situation, and much of the interchange is more involved in maintaining the group than in furthering the problem to be solved. (3) Group pressure for conformity. The timid member may have little or no influence on the group, irrespective of his competence.³

Advocates of Delphi seek to avoid these sources of bias by the use of Delphi's three essential characteristics: anonymity, iteration with controlled feedback, and a statistical "group response." Anonymity is provided by the use of questionnaires or other methods of communication by which it is possible to avoid associating specific re-

sponses with specific respondents. In this way the problem of the dominant individual is avoided. As previously indicated, iteration with controlled feedback simply means eliciting each respondent's opinion several times, each time "feeding back" to him in summary form the results of the previous series of replies. By "controlling" the feedback and limiting it to essentials, the nonessential considerations, referred to by Dalkey as noise, are eliminated. The use of a statistical average of the final individual opinions as the group opinion reduces pressure toward conformity and also serves to reflect each member's opinion in the "group" opinion.

Techniques

In the preceding section the essential characteristics of Delphi were mentioned. These characteristics are also techniques, and, indeed, Delphi itself is nothing more than a technique. One might then question the need in this article for a section on techniques. I believe, however, that, in order to gain a more complete familiarity with Delphi, the reader should be exposed to a specific example which can provide a basis for citing some possible modifications to the basic technique. The example I shall use is a question cited by Bernice Brown of RAND who selected it from among those used in a long-range forecasting study reported on by Helmer.⁴ The question is "What will the world population be in the

³ N. Dalkey, *Predicting the Future*, The RAND Corporation, P-3948 (October, 1968).

⁴ T. Gordon and O. Helmer, *Report on a Long-Range Forecasting Study*, The RAND Corporation, P-2982 (September, 1964).

year 2000?" The following is Bernice Brown's simplified description of the elicitation of responses to this question.

In the first questionnaire, all respondents would be asked to record their estimate of the world population in 2000. Each respondent would also be asked to assign a number 1, 2, 3 or 4 as a relative rating, using 1 for the relatively most competent. This score would constitute a self-appraisal. A respondent would be expected to look at all the questions in the set and assess his relative competency in each one. The information from these responses which would furnish feedback data for the second interrogation would be the median and the interquartile range (i.e., the middle 50 percent of the responses).

In the second round, respondents would be asked to reconsider their estimate and revise it if they desired. They would also be asked to give the reasons for the estimate and state what factors were considered in obtaining the answer. They may also be asked to describe the rationale that led them to a revision of their original estimate. Some of the reasons given for population estimates at the low end of the scale were (a) rapid increase in use and effectiveness of birth control measures, (b) increased economic prosperity, (c) progress in welfare and education in the developing nations and (d) attrition due to war and disease. Among the reasons for high estimates were (a) medical advances resulting in lower death rates, (b) insufficient acceptance of birth control measures, (c) development of centralized world government providing efficient distribution of food, shelter and services and (d) advances in agriculture. Participants indicated that they projected birth rates and death rates and net growth rates in arriving at the population estimates.

In the third questionnaire, the median and interquartile range of the previous round would be given along with a summary of reasons for high and low population estimates. Participants would be asked to give a critique of the reasons offered by members of the group and to specify which arguments

were found to be unconvincing and why. Responses to the third round included estimates that the death rate would drop from 19 per 1000 to a figure between 10 and 17 per 1000 and that birth rates would decline from 36 per 1000 to a figure between 15 and 26 per 1000.

In the fourth round the median and interquartile range of the previous round would again be used as numerical feedback. The counter-arguments against reasons for high and low estimates would be summarized. Majority and minority opinions on the projection of death rates and birth rates would be described and respondents then asked to reconsider the pros and cons presented and give a final, possibly revised, estimate of the world population in the year 2000.

Each respondent would also be given an opportunity to revise his own relative competence rating.

The median of these final responses would then be taken to represent the group response on the required answer.⁵

The procedure just described does not constitute a completely fixed mode of operation of Delphi. Modifications are possible and some have been discussed and tried. For example, the self-appraisal could be eliminated. Also, as pointed out by Bernice Brown, the respondents could be asked to furnish a list of subsidiary questions, the answers to which they believe would be helpful in arriving at a "good" estimate. The answers to those subsidiary questions could then be either estimated by the respondents in the next series of replies or provided by an external researcher.

Another aspect susceptible to modification is the feedback of group responses. Rather than requesting each respondent to cite the reasons for his

⁵ B. Brown, *Delphi Process: A Methodology Used for the Elicitation of Opinions of Experts*, The RAND Corporation, P-3925 (September, 1968).

estimate, only those whose estimate was either extremely high or extremely low could be so requested. Extremely high or extremely low might be interpreted as those in the top or bottom quartile. It has also been suggested that with the exception of factual information, such as that provided by the external researcher, the feedback of anything other than a quantitative representation of the previous round's response might not be of much value.⁶

Experimental Uses

Several experiments with Delphi have been conducted both at RAND and elsewhere. In this section I shall mention a few of these and their results. Later in this article some non-experimental applications will be cited.

In 1964 an experiment was conducted using RAND staff members as respondents. In that instance "almanac type" questions for which numerical answers were available were used. This experiment compared two groups, one receiving feedback and one not. The results were that the group to which feedback was provided achieved a sharper consensus than did the other group but did not achieve a more accurate answer than did the group which received no feedback.⁷

In 1968 a more extensive series of experiments of the same type was conducted by RAND staff members, but this time upper class and graduate stu-

dents from UCLA were respondents. These experiments were designed to compare face-to-face discussion with controlled feedback and to evaluate controlled feedback as a technique for improving group estimates. The overall results of these experiments—there were 10 experiments involving almost 5,000 answers to about 300 questions on each of several rounds—as reported by Dalkey "indicated that, more often than not, face-to-face discussion tended to make the group estimates less accurate, whereas, more often than not, the anonymous controlled feedback made the group estimates more accurate."⁸ Similar results were obtained in a separate study, conducted by Campbell, in which the respondents were called upon to make short-range forecasts of a set of 16 economic indexes.⁹

Opinion Categories

In the experiments just cited, the participants were asked for opinions regarding factual material. Similarly, in most of the nonexperimental uses of Delphi that have taken place, questions requiring factual judgment have been asked, frequently in the form of requests for predictions. Typical of these are Delphi exercises designed to develop group estimates of the dates by which specific events will take place.¹⁰ A particular area of interest in this regard is technology forecasting. An

⁶ N. Dalkey, "An Experimental Study of Group Opinion," *Futures* (September, 1969), pp. 408-426.

⁹ R. M. Campbell, "A Methodological Study of the Utilization of Experts in Business Forecasting," Ph. D. dissertation, University of California, Los Angeles, 1966.

¹⁰ R. H. Ament, "Comparison of Delphi Forecasting Studies in 1964 and 1969," *Futures* (March, 1970), pp. 35-44.

⁸ N. Dalkey, "Analyses From a Group Opinion Study," *Futures* (December, 1969), pp. 541-551.

⁷ B. Brown and O. Helmer, *Improving the Reliability of Estimates Obtained from a Consensus of Experts*, The RAND Corporation, P-2986 (September, 1964).

example of this kind of Delphi application is a study conducted by TRW, Inc., to predict the company's operating environment over a 20-year period. A cross section of company personnel was asked to predict the dates of occurrence of events having significant impact on their areas of technical interest. The resulting predictions serve as information sources for planning purposes.¹¹

Although the ability to tap opinion resources regarding these factual kinds of judgments is of great value in a planning context, there is another kind of opinion or judgment that seems of at least equal importance to decision-makers seeking "expert" advice. This is the area of value judgments. Here I am referring to opinions on such questions as the relative desirability of various possible goals or objectives. Delphi has been used experimentally at RAND in the value area, with generally favorable results thus far.¹²

In some less experimental uses, Delphi has gathered and refined combinations of factual and value judgments. In 1966 the technique was used in a wide-ranging study at the Institute of Government and Public Affairs at UCLA entitled "Innovation in Education." In that study Delphi respondents were asked to suggest education values that had not received appropriate attention, determine needed changes in educational policy or practice, and suggest areas for research. Additionally, in the final round respondents were

asked to estimate the costs of each of the many innovations being examined.¹³ In another policy area, that of civil defense, a Delphi exercise, reported in May 1970, was the vehicle used to obtain group judgments as to desirable and feasible courses of action.¹⁴

Potential Uses in GAO

As can be seen from much of the preceding discussion, Delphi has been generally viewed as having application in the area of planning or forecasting. It is in this area that the "expert" has been traditionally called upon, for the obvious reason that there is a limit to the amount of "knowledge" that can be said to exist about the future and thus it is necessary to resort to reliance upon "opinion." Since it is "opinion" that Delphi is concerned with eliciting and refining, its relevance to the planning or forecasting area is obvious.

In examining the potential usefulness of Delphi to the General Accounting Office, the application that seems most obvious is that of long-range planning. In that context Delphi might be employed at the highest levels of the Office in eliciting the advice of persons both within and outside GAO on matters having impact on future directions of effort and the resulting quantitative and qualitative staffing requirements.

¹¹ M. Adelson, M. Alkin, C. Carey, and O. Helmer, "The Education Innovation Study," *American Behavioral Scientist*, Vol. 10, No. 7, 1967.

¹¹ H. Q. North, *TRW Looks at the Future*, TRW Systems, Inc., 1967.

¹² N. Dalkey and D. Rourke, *Experimental Assessment of Delphi Procedures With Group Value Judgments*, The RAND Corporation, R-612-ARPA (February, 1971).

¹⁴ E. Paxson, *A Delphi Examination of Civil Defense: I. Questions, Issues, and Arguments*, The RAND Corporation, RM-6247/1-ARPA (May, 1970). (For Official Use Only).

Apart from such long-range and continuing applications, I can envision Delphi being a useful tool in specific GAO assignments. The Comptroller General has recognized the important role that expert consultants can play in the work of the Office and has announced his intention to increase their use in the future.¹⁵ In many instances the consulting needs of a GAO assignment will be best met by the use of one or two experts working on a day-by-day basis either in close contact with the audit staff or on a completely separate portion of the work for which they assume significant responsibility. Delphi would not seem to be particularly useful in such situations. Where this kind of day-to-day "work" is not what is required from consultants, however, but what is needed is more in the nature of interpretive reactions to what the audit staff is finding and advice in the development of recommendations, Delphi seems eminently relevant.

An additional way in which Delphi might usefully be applied by the Office would be as a means of discovering and, at least in a limited sense, evaluating alternative actions in program or policy areas about which little "hard" knowledge exists as to the results that might ensue from specific actions. I might mention here that at present it appears that there is not a scarcity of program and policy areas that fit this description.

The approach to which I am referring is similar to that taken in the previously mentioned educational in-

novation study. There, the suggested innovations were, in the final Delphi round, "costed out" in some highly inexact sense. Extending the Delphi to the estimating of costs of each alternative results in an attempt at a cost-effectiveness analysis. Briefly, the steps are: (1) the identification of apparently feasible alternative courses of action, (2) some estimate of the contribution of each to the achievement of the objective being sought—perhaps in the form of a ranking rather than that of a quantitative estimate, and (3) estimates of the cost of each alternative.

An analysis such as that just described might not seem to be of great validity. If an informed and broadly representative panel were selected, however, the resulting analysis would probably be of at least equal validity to that done, either explicitly or implicitly,¹⁶ by any one knowledgeable person or a group representing a single point of view, such as that of an agency charged with responsibility in the program or policy area of interest. There might be many instances in which it would not be necessary to extend the Delphi through all of the steps outlined above. For example, the cost estimating portion might best be carried out essentially "in-house," after the Delphi respondents had identified the feasible alternatives. In studies of broad policy areas, it is perhaps at this "get a handle on the problem" level that Delphi can make its greatest contribution to GAO's efforts.

¹⁵ Elmer B. Staats, "Management or Operational Auditing," *The GAO Review* (Winter, 1972), pp. 25-35.

¹⁶ If a choice of one alternative is made without any analysis, the "choice-maker" can be said to have implicitly performed an analysis that indicated that the alternative he selected was the best available.

In any discussion of Delphi's "usability" the question of its time consumption proclivities must be faced. The time required to process the information developed during a Delphi exercise of three or four rounds can be considerable. To a great extent, however, this problem might be minimized in the future through the use of computers. Respondents having access to computer terminals could, while maintaining the anonymity associated with Delphi, respond, either quickly or at their leisure, to questionnaires sent to them via the computer terminals. An initial attempt in this general direction was carried out in 1970 under the direction of Murray Turoff of the Office of Emergency Preparedness.¹⁷ This kind of communication system, which Turoff chose to call Delphi conferencing, seems to offer the possibility of involving regional and Washington GAO personnel as well as external "experts" in an exploration of wide-scope questions.

Cautions

After suggesting these uses of Delphi, I should add a few cautionary comments lest this article be construed as a call for immediate and widespread adoption of the technique by the General Accounting Office. First, I would emphasize that although it is widely used—IBM, the National Industrial Conference Board, Xerox Corporation, and the American Accounting Association's Comparative Practices Study

¹⁷M. Turoff, *Delphi Conferencing*, Executive Office of the President, Office of Emergency Preparedness, Technical Memorandum 125 (March, 1971).

Committee are among organizations that have employed it—Delphi should still be regarded as experimental, certainly in other than forecasting applications. For this reason, the Office at this time might best attempt its use on an experimental basis on one or a few carefully selected assignments. In this way the feasibility of using Delphi or selected features thereof in the work of the Office could be operationally assessed. An additional comment that should be made here is that in any comprehensive exploration of a significant policy area Delphi would probably serve as an adjunct to one or more of a wide variety of other techniques rather than as the sole information-producing vehicle of the review.

One aspect of the technique to which I have devoted insufficient attention thus far in this article is that of the demands placed upon those directing the exercise. As is the case with many of the new techniques currently becoming available to the auditor, Delphi is unfortunately not automatic. It requires the not insignificant effort of developing the original and subsequent questionnaires, some careful pruning in choosing "feedback" material and, perhaps more importantly than might initially be assumed, knowing when to "quit" the exercise. These requirements all precede the important one of effectively using the results.

Conclusion

Now that I feel I have added the appropriate balance, I should sum up what I think Delphi represents. In my view, it is a significant improvement

over the face-to-face discussion method of obtaining a group opinion. As such, it represents a new and potentially useful device for capturing "information" that has always been recognized as important, namely, the opinion, judgment, or intuition—choose your term—of people who are knowledgeable in the area being studied. Although we some-

times don't think of it in these terms, I believe that our role as auditors or analysts—again, choose your designation—is essentially one of providing relevant and coherent information, usually to our congressional decision-makers. Delphi, I believe, offers an opportunity to enhance our ability to fulfill this role.

GAO's Value and Importance

* * * you are engaged in a highly satisfying form of public endeavor. You search for the imperfections in Government in order to make Government more efficient and effective. You help to shore up the foundations of Government, to strengthen its bearing walls, to repair its cracks and crevices, to smooth its rough edges, to make it habitable and enduring.

Your work is important above all for the assurance it gives to the citizens of this democracy that the Congress has created and works with an institution that keeps an eye on the executive branch and worries about the taxpayer's dollar.

Representative Chet Holifield

Chairman, House Government Operations Committee.

Speaking at GAO honor awards ceremony, June 11, 1971.

721813

Using the Time-Sharing Computer in Management Reviews

GAO's experience and progress in using the time-sharing computer to analyze pertinent data in evaluating traffic management practices of Federal agencies are reviewed in this article. It is based on a video presentation of the subject to the Comptroller General's Program Planning Committee in November 1971.

Introduction

The Transportation and Traffic Management Review Branch of the Transportation Division has turned to the time-sharing computer to more effectively evaluate traffic management practices and problems in Federal agencies. Because of the cumbersome form in which raw transportation data is available, a process of refining is necessary to produce meaningful statistics. We find that the time-sharing computer is uniquely adaptable to achieve the desired results.

In the time-sharing system, each user has a teletype (terminal) which is connected by telephone to one central computer. The user can write his own programs or use library programs written by systems analysts of the time-sharing companies. The library pro-

grams are available to users of the time-sharing service without additional charge—the user has only to adapt his data to the specific requirements of the programs. The cost to run these programs ranges from \$8.00 – \$12.00 per hour besides a minimum monthly charge for use of the terminal.

Our first attempt in using the time-sharing computer was to perform statistical analysis, using a library program in the time-sharing computer system. This application led us to search for additional instances where use of computer analysis would prove fruitful. As a result, we found many different areas for these applications, but the conditions of these applications required us to develop our own programming skills, rather than rely exclusively on library programs.

Mr. Donnellon and Miss Eastin are management auditors in the Transportation Division. They joined GAO in 1970 and hold B.S. and B.B.A. degrees from Tri State College and Wake Forest University respectively. They are both pursuing masters degrees at The George Washington University.

Initially, programming assistance was provided by the Financial and General Management Studies Division. Members of the FGMS staff provided us with elementary manuals for programming in the beginners' all-purpose symbolic instructions code (BASIC) language. The interest of other Transportation Division staff members in our initial programming efforts caused us to arrange special computer classes for 28 members of our staff. Each person received a total of 24 hours of instruction in the use of the time-sharing computer and the BASIC programming language. We are investigating other time-sharing computer courses we can use to advance our capability

in this area. To date, we have found applications for the time-sharing computer in connection with three of our current reviews.

Ammunition Freight Rate Study

In a study of Government transportation rates, we found that the Department of Defense spends about \$300 million annually to transport ammunition within the continental United States. The objective of our review was to determine the reasonableness of the transportation rates paid to rail and motor carriers for these shipments. As a basis for determining the reasonableness of the rates, we decided to con-



GAO Watchdog Photo

The authors, Miss Eastin and Mr. Donnellon, utilizing the time-sharing computer.

struct a "should be" rate, which is the carrier's fully distributed cost—the sum of constant and variable costs—for each shipment. The "should be" rate was developed using statistics obtained from rail and motor cost guides published by the Interstate Commerce Commission (ICC), compiled from financial data furnished by the carriers.

Our problem was to construct "should be" rates on selected ammunition shipments from 33 origin shipping points to three destination ports of embarkation. We also wanted to compare the "should be" rate with the actual rate charged the Government to determine the potential savings. We made about 600 computations, each of which would have required about 2½ man-hours using a high-speed desk calculator. Since the total time to do these calculations would have been about 188 man-days, we wrote a program to compute each of these "should be" rates in our analysis for use on the time-sharing computer. The result was a saving of about 180 man-days, plus error-free results.

Incorporated in our computer program was the ICC Cost Guide data for rail and motor carriers and the ICC formula used to compute the "should be" rates from this data. We had to supply the data for the weight and mileage of each shipment for our program. The ICC Cost Guides divide the United States into territories, each with different cost statistics. We had to determine the total mileage of our shipment from tariffs and mileage guides by applicable territory. Then, depending on the type of carrier equipment and the weight of the shipment,

we used the terminal to compute the out-of-pocket costs and constant costs for the entire shipment. The sum of the out-of-pocket costs and constant costs is the fully distributed cost of the shipment or the "should be" rate.

We wrote another program for the time-sharing computer to compare the "should be" rates with the lowest rate offered by the carrier for the particular shipment. This program also determined the potential dollar savings by the Department of Defense through the use of the "should be" rates. We estimate that approximately 142 man-days were saved by using the time-sharing computer for this analysis. We found that the Department can realize substantial savings if rates can be negotiated that are more closely aligned with the carrier's fully distributed cost or "should be" rate. This program was written with the intention of using the final printouts as schedules in the report with the headings and columns titled and all data organized in appropriate columns. (See sample on p. 31.)

We have furnished the Department of Defense a copy of these computer programs for its use in monitoring the reasonableness of carriers' rates with a minimum expenditure of manpower.

Department of Agriculture Freight Rate Study

Our experience gained from the ammunition freight rate study suggested that a similar cost comparison could be made on a cross section of rates used by the U.S. Department of Agriculture (USDA).

SECTION 22 STUDY - CODE 43167

RAIL

| POINT OF ORIGIN | COM-MODITY NUMBER | WEIGHT 1000 LBS. | DESTINATION | | BANGOR, WASH. | | DOLLAR DIFF. \$ | PROFIT PER-CENT |
|-----------------|-------------------|------------------|-----------------------------|---------------|------------------------------|--------------|-----------------|-----------------|
| | | | --- ACTUAL --- RATE \$/CJT. | --- CHARGE \$ | -- SHOULD BE -- RATE \$/CJT. | -- CHARGE \$ | | |
| CRANE | 5940 | 251592 | 3.50 | 8305752 | 1.14 | 2368159 | 5937593 | 207.0 |
| DEFENS | 5930 | 8819 | 2.97 | 261941 | 1.49 | 131411 | 130529 | 99.3 |
| DOYLIN | 5930 | 9527 | 2.88 | 274395 | 1.75 | 166733 | 107652 | 64.6 |
| DOYLIN | 6030 | 10198 | 2.88 | 293712 | 1.75 | 178471 | 115241 | 64.6 |
| HAYWOOD | 35700 | 5490 | 3.10 | 170190 | 1.52 | 83448 | 86742 | 103.9 |
| LACITY | 5980 | 12741 | 3.10 | 394934 | 1.17 | 149074 | 245909 | 165.0 |
| PARSON | 5930 | 38696 | 3.12 | 2767335 | 1.16 | 1028331 | 1738454 | 169.0 |
| WBURLI | 5930 | 10530 | 2.99 | 314360 | .99 | 104251 | 210609 | 202.0 |

We attempted to circumvent the necessity of looking up mileages in railroad tariffs and routing guides by comparing a random sample of mileages between selected points in the United States for both railroad and highway distances. We already had available a computerized version of Rand McNally's Household Goods Carrier's Bureau Mileage Guide, and we wanted to determine whether an adjustment could be made in the highway mileages to accurately correspond with the rail mileage. We used a library program on regression analysis to adjust highway mileage figures from our sample to approximate rail mileages. We then compared the computed rail mileage with the actual rail mileage derived from the tariffs. However, we decided not to use the Household Goods Mileage Guide because the rail mileage calculated by using the regression analysis did not approximate the rail mileage with a sufficient degree of

accuracy to be used as a basis for future calculation.

The program utilized on the ammunition freight rate study was then modified to work with the available data from USDA. For our study of "should be" rates by USDA, it was necessary to use a random sample of the total shipments made by USDA in 1 year. Because the basic objective was to find whether or not the "should be" rate was below the billed rate, we decided to use a statistical test of hypothesis.

This test analyzes possible sampling error in either the billed rates or the "should be" rates. Although there is a library computer program available to perform this test of hypothesis, we decided it would be easier to incorporate this analysis into our program to calculate the "should be" rates. Through this method, we would be able to determine if the difference between the billed rate and the "should be" rate is substantial and not related to sample

error. Since this review is currently in progress, we have only analyzed 25 shipments out of a sample of 250. However, we estimate that 15 man-days have been saved to date with a potential saving of at least 150 man-days through using the time-sharing computer on this job.

Inventory of Government Programs Affecting the U.S. Merchant Marine

In this review, we identified various Cargo Preference and Economic Assistance Programs under which Government overseas shipments are made. We collected data from some 20 Government agencies involved in shipping or arranging for shipments of various commodities overseas. One objective was to determine what these programs cost in appropriated dollars by limiting the use of lower cost foreign flag vessels.

Because of the large number of shipments by each agency, we first used statistical sampling to calculate the total tonnage and transportation charges. We had to decide the percent of accuracy needed in our analysis. We then used a library program of the time-sharing computer system to determine our required sample size. However, the needed sample size was almost the same as the total universe size; as a result, statistical sampling was not feasible in this analysis.

Because of the volume of shipments we had to analyze—for example, 5,300 from the Department of Agriculture alone—the time-sharing computer proved the ideal mechanism for our study. We found weight factors in dif-

ferent units of measurement: long tons, short tons, metric tons, cubic feet, pounds, gallons, hundredweights, and bushels. We wrote a computer program to convert these weight factors to a standard unit of measure and to determine the total tonnage and total transportation charges by agency and program. We estimate that we saved 59 man-days by using the time-sharing computer on these agriculture shipment statistics alone and computations were accurate.

We plan to compare this information with our estimate of what it would have cost if these shipments could have been made on available foreign flag vessels to determine what the cargo preference acts are costing in appropriated dollars.

Conclusion

Since many of the transportation management reviews involve the identification of transportation costs or comparisons between rates of different carriers or modes of transportation, the use of the time-sharing computer has simplified our work. The time-sharing computer has enabled us to use more sophisticated statistical techniques, achieve greater accuracy, and expand the scope of our reviews. In the process, it has reduced the man-days necessary to perform our work. Although the computer must be adapted to the job rather than the job to the computer, our past experience has made us more acutely aware of the potential and adaptability of the time-sharing computer for performing our audit work.

721819

Using Test Decks in Financial Audit Work

This article describes one of the many audit techniques used during GAO's recent audit of the Panama Canal Company/ Canal Zone Government's financial statements. The article illustrates how the test deck approach was used to audit the Canal enterprise's automated payroll system.

A common technique used today in performing an audit of a data processing system is the test deck. In general terms, a test deck is a means by which one may test a computer program for accuracy and logic and ascertain whether or not the computer is functioning as intended. A test deck generally takes the form of a deck of punched cards containing valid and invalid transactions to be processed by the computer. By processing the test deck transactions through the computer (and therefore through the program for which the test deck was designed), the auditor can determine, by evaluating the output, the system's reaction to each type of transaction.

Testing can encompass as many transactions as deemed necessary to accomplish the audit objective. By using the test deck approach, the accuracy and logic of a computer program can be thoroughly evaluated. Also, the auditor can easily determine whether processing is taking place as set forth in the program documentation.

Background

GAO is required by law to make an annual audit of the Panama Canal Company—a wholly owned Government corporation. One objective of the audit is to state an opinion on the Company's financial statements. Be-

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cause the Company and the Canal Zone Government—the independent agency of the United States charged with the civil government of the Canal Zone—are closely related in mission, organization, and operation of the Canal enterprise as a whole, GAO also examines and issues an opinion on the financial statements of the Canal Zone Government.

The Canal enterprise as a whole can possibly be related to the operation of a port city that has a population of from 50,000 to 75,000 with one company operating all activities in the city. The Canal Zone Government performs the functions normally associated with the civil government—including education, health, sanitation, and police and fire protection. The Company operates and maintains the Canal and locks and various supporting service activities. Supporting service activities include harbor terminal and vessel repair operations; a steamship service between New Orleans, La., and Cristobal, Canal Zone; a railroad across the Isthmus of Panama; electric power, communication, and water systems; and many other services essential to employee welfare such as retail stores, restaurants, and housing.

The Company also acts as an agent in administering various functions for the Canal Zone Government. These functions include services such as legal and personnel matters, and budget and accounting operations.

The Canal enterprise as a whole is designed to be operationally self-sustaining and to impose no burden on the U.S. taxpayers. Revenues from the

Company's Canal transit and supporting service operations are used to finance its operating and capital expenditures and to reimburse the U.S. Treasury for the net cost of operating the Canal Zone Government—the amount by which the cost of operating the Canal Zone Government, including depreciation of fixed assets, exceeds its revenues.

The Canal enterprise employs from 16,000 to 17,000 employees at any one time, the majority of whom are paid through a computerized payroll system. A National Cash Register (NCR) 315, Model 100, computer is used by the Company to process the payroll application. The Company also uses a recently acquired NCR Century 200 computer for printing edited tapes and batch listings and for processing certain additional applications.

The Canal enterprise's total annual payroll and related expenses amount to about \$139 million. Excluding payroll cost transferred to capital projects and a portion of the Canal Zone Government payroll expense that is recovered and is not included in the net cost absorbed by the Company, payroll and related expenses amounted to about \$110 million, or 63 percent of the Company's total operating expense for fiscal year 1971.

Because of the significance of payroll and related costs to the total operations of the Canal enterprise, we decided that the test deck approach would be extremely beneficial. Our use of the test deck was in addition to the audit steps normally performed in payroll audits.

Audit Perspective

Our objective was to evaluate the internal control of the computerized payroll system by designing and applying a test deck to determine if the controls were in operation and if they were providing the checks that they were intended to provide.

Audit Approach

Our initial step toward developing the test deck was to obtain an understanding of the computerized payroll system by reviewing the payroll systems manual and by interviewing responsible Company officials. We also reviewed GAO's and the Company's internal auditors' work on previous payroll audits. These activities were primarily concerned with the flow of input documents, the information contained on these documents, and the controls maintained over these documents. We believe that this step is extremely important since an overall understanding of the system is crucial to the preparation of a good test deck.

Selection of Programs for Testing

Through the above process we were able to identify areas in which we needed to concentrate our attention. We then obtained the following documentation:

1. A listing of error messages printed by the computer in order to give us an idea as to the type of errors the payroll system was currently designed to detect.

Through review of such listings one can get a feel for the type of edit checks and the adequacy of the edit routines being employed.

2. A copy of the payroll keypunch instructions in order to determine the data that was actually being keypunched and used as input into the system. These instructions also gave us an idea as to the type of input documentation that would be needed for the test deck construction.
3. A listing of the current payroll programs and a copy of the detailed payroll system flowchart to aid us in selecting the programs to be tested. This step is important since we will always be limited, by time, in the actual number of payroll programs that can be tested.

After reviewing the above documentation, we selected two validation programs and the pay calculation program for detailed testing. The programs selected were (1) the validation programs which control the initial input into the system and (2) the program which actually calculates pay and updates leave balances. We believe that in most payroll applications the validation programs and the pay calculation programs would be the most critical programs and generally would be the ones tested.

Master Files Duplicated

Our approach was to process the test deck through the payroll system as if it were the input for a normal payroll

operation. To do this we first determined the tape files that had to be duplicated in order to process a "dummy" payroll operation. At the Canal enterprise, this involved three magnetic tape files: (1) the Employee Master File, (2) the Employee Master File Extract, and (3) the Billings and Deductions File.

After it was determined which payroll period we would use, we requested that each of the above tape files be duplicated. With the three duplicated tape files, it would be possible to recreate the selected payroll period at a later date and use the test deck as input to the payroll operation. The duplication of files is extremely important since in processing the test deck we can avoid use of the original tape files and thereby preclude any possibility of damaging agency files. Further, by obtaining duplicate tape files we have more flexibility in scheduling our test deck for processing. We also obtained a second duplicate of the Employee Master File so we could be in a position to determine the possible effect of the erroneous transactions, if any, getting through the system. This can be accomplished by comparing the Master File updated through processing of the test deck to the second duplicate Master File. Such a comparison could be important in demonstrating the effect of erroneous transactions in the system.

Construction of the Test Deck

A tape dump (printout) of the Employee Master File was obtained in order that we could use actual em-

ployee files in preparing the test deck transactions and input documents. The Employee Master File tape format was also obtained in order that we could read the tape dump. The tape dump and the tape format were used to locate (in the tape dump) the type of employees which fit the requirements for a particular test and to extract the data necessary for preparing the input documents.

At this point in time we were in a position to start the actual construction of the test deck. We started this process by reviewing the Company program run books which contain, among other things, a run writeup for each computer program. This writeup is composed of a narrative description of the program, a description of the inputs into the program and the outputs from the program, the processing rules for the program, and all amendments to the program. The run writeups were used extensively in lieu of program logic diagrams in producing the test deck. We were fortunate in that the Company documentation was excellent, which, in our experience, has not been true of a number of other computer activities.

The basic approach used was to review the edit checks and calculation procedures indicated in the program documentations and concurrently set up transactions to test the edits and calculation procedures. For example, if the run writeup stated that an error message would be printed if an invalid identification number was utilized, we constructed a test using an invalid number to see if the error would actually be detected. We tested almost

every single edit check and calculation that was listed in their documentation. Both valid and invalid conditions were generated for testing the validation programs and the pay calculation program.

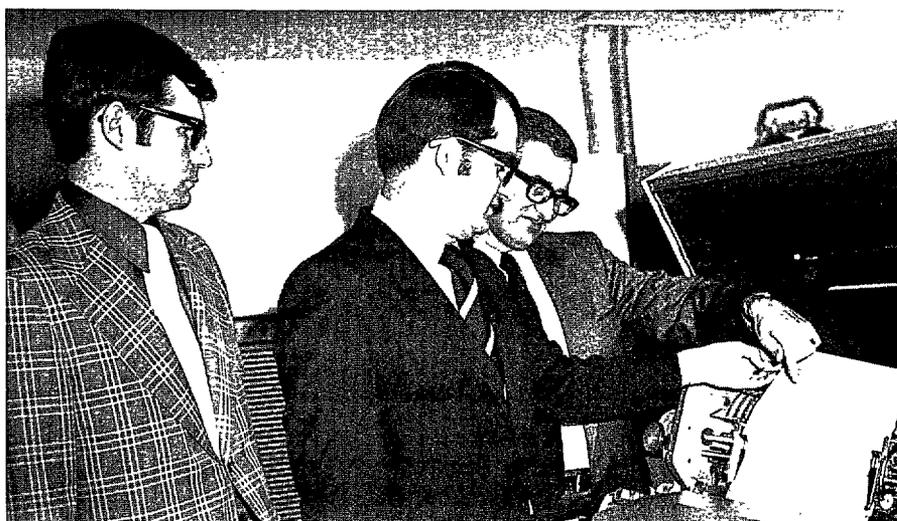
Our next step was to test the payroll system in general by constructing numerous input documents to test various erroneous and illogical conditions which apparently were not covered in the run writeups. For example, we created a situation whereby an employee was given a step increase before it was due. Another situation was an attempt to give employees overtime pay when their particular pay category was not entitled to such pay. The benefits from this step depend to a great extent upon the imagination and knowledge of payroll by personnel creating the test deck. It can be very beneficial if the auditors are alert to the various things which could happen and which are not

covered by edit checks.

During the actual test deck construction we made constant reference to the Employee Master File tape dump to make sure that the selected employees met the conditions necessary to test for a particular situation. However, to the extent possible the employees who were included in our test deck were selected at random from the Master File tape dump.

Processing the Test Deck

Concurrently with the development of the test deck transactions a workpaper was prepared which showed each transaction being tested and the expected results. Space was left on this workpaper to record the actual results of processing the transaction. For each test, a different employee was used and a separate input document was prepared.



The authors examine a computer printout. From the left: James W. Bynum, Arley R. Whitsell, and Daniel C. White.

The input documents were batched, keypunched, and processed as though the test deck were a normal payroll operation. The test deck was first processed through the validation runs.

As expected, we received a number of error messages from the validation runs. The error messages showed that the validation programs as described in the documentation were working properly. We also received some error messages for transactions that we had wanted to clear the validation programs which were caused by mistakes in our test deck. We then analyzed the printouts and input documents to determine the corrections and/or changes which might be needed in our test deck before processing any further.

The problems encountered at this point, in our opinion, were typical of what one should expect. In fact, in the absence of good program documentation one will probably get a considerable number of rejects in this phase. The important thing is that the auditor must carefully review the test deck process at this point to (1) insure validity of input for subsequent tests, (2) verify the edit checks that are or are not present, and (3) correct test deck preparation errors.

After we were satisfied with our test deck, we then proceeded to process the test deck through the remainder of the payroll system. We would like to emphasize that a GAO auditor was present for all processing and retained all output (various reports, console printouts, and produced magnetic tapes). At the conclusion of the processing, we then traced each test deck transaction

through the various output documents to determine the effect, if any, of the erroneous transactions which were processed through the system. The results of each test were entered on the previously mentioned workpaper.

Results

Review of the test deck results disclosed that the validation programs detected all of the erroneous conditions that they were designed to detect. In other words, we found that if the Company's documentation stated that an edit was in the program, we found that the edit was in fact present and operating correctly. Also, we found that the pay calculation program calculated pay correctly and updated the leave balance in accordance with the Canal enterprise's regulations. However, we did question the timing utilized in updating leave balances. We noted that gross pay was calculated before the employee's leave balance was updated. When this method of accruing leave is utilized, an employee may not use the leave accrued in the current pay period until the next pay period. This could also result in an employee not being able to accrue leave while on leave.

Our review of the payroll system in general disclosed a need for additional computer controls. We found that a number of erroneous conditions were processed through the payroll system without detection. The problem areas warranting computer controls involved basically the entitlement to additional compensation and step increases.

In subsequent discussions with the Company's payroll personnel, however, we found that manual procedures and controls had been established for a majority of the erroneous conditions noted by our test deck. We discussed all points with appropriate Company officials from the standpoint of transferring manual controls to the computer for greater efficiency.

The Company officials concurred in the majority of our points concerning the need for additional computer controls and advised us that definite action would be taken by providing additional controls to the validation programs. The Company immediately changed its method of updating leave balances. The leave accrued during the current pay period is now added to the employee's leave balance at the beginning of the period before gross pay is computed.

In view of the Company's acceptance of the results of our test deck, the type of erroneous transactions disclosed by our test, and the existence of manual controls, we did not process our test deck to the second duplicate Master File.

Conclusion

The use of a test deck can be a valuable auditing tool. It is one method, the easiest one in our opinion, by which an auditor can test the computer programs and determine how the particular processing system will react to specific transactions or to varying sets of circumstances. If properly accomplished, the actual results obtained through the use of a test deck are virtually irrefutable.

We believe that our experience with a test deck in the Canal enterprise audit gave us increased confidence in our audit of their financial statements. We would like to point out that the use of a test deck need not be restricted to payroll applications since this very valuable tool can be used to evaluate almost any type of system. The basic problem with a test deck is that it can be a time-consuming process. However, once a test deck is written to cover a system it will only need updating to be used at a later date. Also, the test deck process is not unduly time consuming if, as was the situation in our case, excellent assistance and cooperation are obtained from the agency's computer personnel.

Reporting on Major Weapon Systems

This article discusses the operations of GAO's Major Acquisitions Group in reviews of major weapon systems, with particular emphasis on its unique analysis and reporting to the congressional committees concerned with weapon acquisition.

Formation

As a result of increased congressional interest in major weapon systems, GAO formed the Major Acquisitions Group (MAG) in mid-1969. This new group, established within GAO's Defense Division, was given the responsibility of making continuing reviews on a current basis of major weapon systems which are in various stages of the acquisition cycle. This review responsibility begins with the decision by the Secretary of Defense to commit substantial resources on a particular system and carries through the various stages of concept formulation, validation, full scale development, production, and deployment.

The Major Acquisitions Group has as its primary objective the determination of (1) the basic causes of weapon system cost growth, schedule slippage, and deterioration of the originally expected performance character-

istics and (2) the options available in the remainder of the program, in order to make recommendations for improving the weapon acquisition process. Particular attention is given to providing greater assistance to the Armed Services and Appropriations Committees by the timeliness and completeness of information on the status of major weapon systems.

The Major Acquisitions Group's special responsibility is to (1) examine into and report on the status of the largest possible universe of weapon systems calling to the attention of appropriate committees such data on individual weapon systems programs as might be useful to their deliberations and (2) prepare for the Congress a comprehensive overview of weapon system program management. This responsibility is special since, to meet the Comptroller General's commitment to furnish the most current data practi-

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cal in time to be useful in annual authorizations and appropriation hearings, the work must always be performed under stringent deadlines.

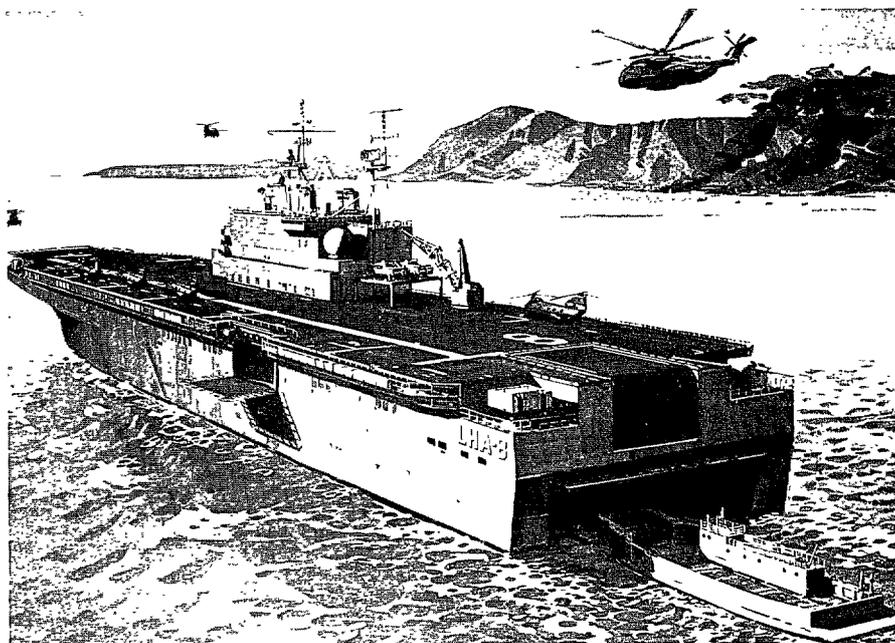
So much for MAG's responsibilities. I would now like to describe how MAG has carried out these responsibilities in annual reports issued to the Congress. I will emphasize report style and content and show why I believe these reports have been timely, effective, and comprehensive.

First Annual Report

Our first annual report to Congress (B-163058, Feb. 6, 1970) represented an in-depth analysis of the cost, sched-

ule, and performance status of 57 major weapon systems as of June 30, 1969. The report also included an evaluation of the Selected Acquisition Reporting System of the Department of Defense. Selected Acquisition Reports (SARs) are prepared quarterly on major weapons and contain information on a weapon's projected costs, schedule milestones, and performance estimates.

An unclassified overview report was issued together with 57 individual weapon system staff studies as appendixes. (Staff studies are discussed in more detail later in this article.) The overview report highlighted underlying causes for significant cost growth and



Litton Industries Photo

The LHA is a combatant general purpose amphibious assault ship designed to be capable of transporting and landing troops and their essential combat equipment and supplies in amphibious assault by means of helicopters, landing craft, and amphibious vehicles.

also had a heavy impact on changing the design and improving the quality of the SARs. The report also highlighted significant variances in weapon system performance estimates and schedule milestones. One direct result of this report was that the SAR was improved by the requirement that cost growth be identified and recorded in nine distinct categories.

Second Annual Report

Our second annual report to Congress (B-163058, Mar. 18, 1971) involved the status of some 70 major weapon systems. I believe that this report was unique and the first of its kind ever issued in GAO. There are many reasons for this, some of which I will discuss in this article.

The products of this review consisted of an unclassified overview report and 67 classified weapon system staff studies. Staff studies are prepared by GAO's regional offices scattered throughout the country. The field offices conduct reviews of weapon systems in accordance with general audit guidelines provided by the MAG. These regional office staff studies contribute heavily toward the overview report which is prepared by the MAG.

Staff Studies

The staff studies included timely, up-to-date information on particular weapon systems and were prepared specifically for use by the Senate and House Armed Services and Appropriations Committees in their authorization and appropriation hearings and to meet any other needs of their staffs.

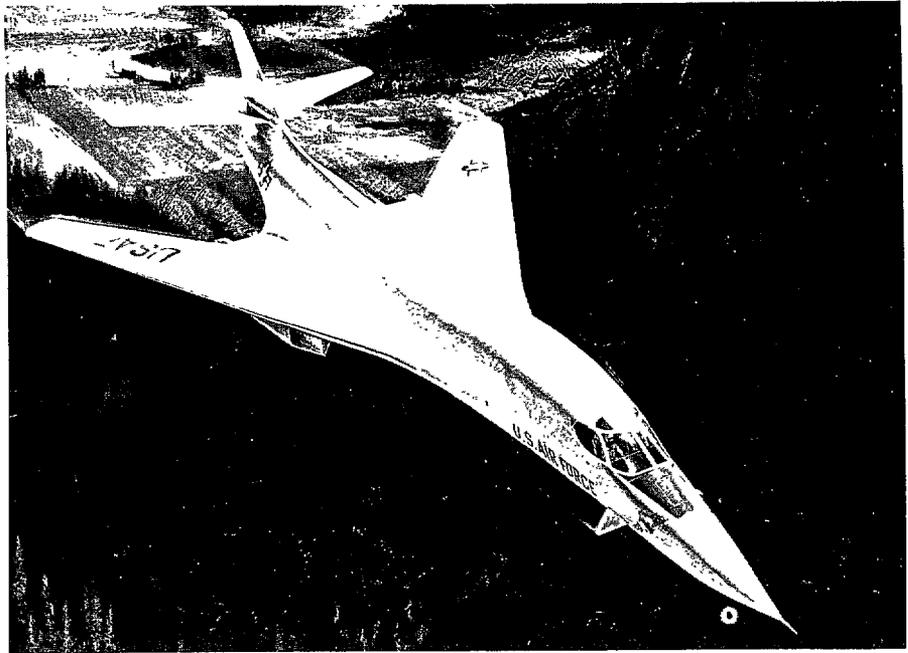
The staff studies were reviewed for accuracy of data at the highest echelons of the military services on a quite expedited basis. Any revisions resulting from this review were made, and formal, written comments were furnished to us by each service some time after the package of staff studies went to press. Therefore, each staff study when released contained the following statement stamped on its front cover:

This document is essentially a working paper prepared by the General Accounting Office for its use in preparing the report to Congress issued on March 18, 1971 (B-163058). No formal comments on the contents have been obtained from the Department of Defense or other agencies.

Preparation of the staff studies involved a much shortened process that avoided the normal procedures with a consequent saving in review and processing time. To further expedite the report process, we contracted with an Air Force printing plant to print the high volume of pages required by the 67 staff studies at a substantial saving from Government Printing Office prices.

The first few pages of each staff study contained a summary of various categories. The summary format was derived from discussions between GAO and the congressional committees and consisted of the following categories:

- System Description and Status
- Performance
- Cost
- Selected Acquisition Reporting
- Program Milestones
- Relationship to Other Programs
- Matters for Consideration



U.S. Air Force Photo

The B-1 is intended to be a four-engine strategic bomber in the 350,000 to 400,000 pound gross weight class, with the ability to deliver large nuclear or nonnuclear payloads over distances of more than 6,000 miles.

The "Matters for Consideration" was a key section in each staff study for it was here that Congress was provided with information on potential trouble spots and possible options.

Use by Committees

The 67 staff studies, issued in March 1971, were used extensively by congressional committees (Senate and House Armed Services and Appropriations Committees) during appropriation and authorization hearings. For example, a review of the published hearings shows that 25 percent of the questions directed to the military services on 62 weapon programs made ver-

batim use of staff study data. Also, information provided in staff studies covered the same area as the expressed congressional interest (e.g., weapon system cost, schedule, performance, need, and capability) in 49 percent of the questions raised.

In order to better comply with the needs of the Congress, we recently arranged meetings with key members of the committees' staffs to which these staff studies were issued to discuss areas where the studies could be made more useful. The general reaction of the committees was that the staff studies have been very useful. They were complimentary about the staff study content and the concise summaries of

cost, schedule, and performance. One of the committees felt that the questions on matters for consideration included in the studies were particularly valuable. Another committee felt that the staff studies were quite useful but that they could be made more so by the inclusion of certain contractual, funding, and other related data. As a result of these meetings, the 1972 staff studies will include this additional information to the extent possible.

Overview Report

The congressional overview report, prepared primarily for Department of Defense action, represented a unique analysis of many programs to discern trends, make projections, note general and recurring problems, and identify underlying causes. The following critical management functions were assessed:

- Identification of the need for a system
- Definition of performance characteristics
- Obtaining assurance of the feasibility of performance requirements
- Cost-effectiveness determinations
- Stability of the program and its relationship to other programs
- Subsystem development phasing and interfacing
- Continuous trade-off between cost and performance
- Technical assessment
- Organization for program management
- Organization "Layering"

This assessment was done by identifying criteria, showing probable effects of compliance and noncompliance with these criteria, and demonstrating by use of weapon system examples good and bad application of the criteria. In addition, the March 1971 overview report contained analyses of cost, schedule, and performance status of major weapons.

One important benefit from the overview report was the identification of certain management areas worthy of further review. As a result, separate reviews were programmed and conducted in the areas of cost estimating, cost effectiveness, testing, and management of changes.

The overview report recommended that the Secretary of Defense should:

- Make every effort to develop and perfect a Department-wide method—now in its early stages of development—to be followed by all military services for determining two things: first, what weapon systems are needed in relation to the Department's missions; and second, what the priority of each should be in relation to other systems and their missions.
- Establish guidelines and standards for the preparation and utilization of cost-effectiveness studies. These guidelines should require that studies be updated and reviewed as part of the decision process when major changes in cost and/or performance require revised schedules for funding commitments.
- Place greater decisionmaking au-

thority for each major acquisition in a single organization within the service concerned, with more direct control over the operations of weapon systems programs and with sufficient status to overcome organizational conflict between weapon system managers and the traditional functional organization.

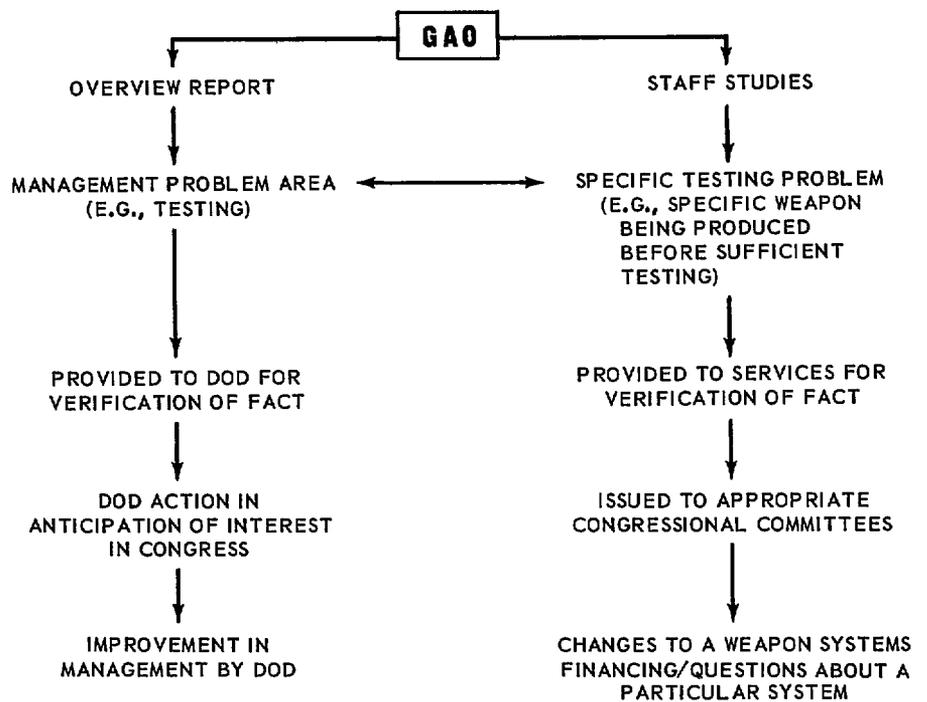
- Insure that each selected acquisition report (1) contains a summary statement regarding the overall acceptability of the weapon for its mission, (2) recognizes the relationships of other weapon systems complementary to the subject systems, and (3) reflects the current status of program accomplishment.

Perhaps the best way to describe how these reports are used is through an illustration (see below).

Third Annual Report

In March 1972, we will issue our third annual report to the Congress. At about the same time, individual staff studies on 74 weapon systems will be furnished to the responsible committees. Over 80 percent of the development and investment funds involved in some 160 major weapon programs are involved in these 74 weapon systems which are the subject of the annual GAO review.

Also as previously stated, staff study data will be expanded to include certain additional information as a result



of meetings with congressional committees. As in our previous review, an overview report will be prepared containing (1) an assessment of management functions critical to the weapon acquisition process and (2) an evaluation of the DOD's Selected Acquisition Reports.

Conclusion

From the foregoing, I believe I have demonstrated the main theme of this

article; specifically, that MAG reports have been:

- Timely because they are available for use in authorization and appropriation hearings,
- Effective because they are extensively used by congressional committees, and
- Comprehensive because they include specifics on large numbers of weapons and generalizations on management of the weapon system acquisition process.

Good Advice

One of the guidelines developed in 1971 for the professional practice of operations research by the Operations Research Society of America provides that:

Insofar as possible, use the vocabulary of his client, introducing only such new concepts and terminology as are essential to understanding the findings (the jargon and technicalities of operations research should be avoided to the greatest extent possible).

From *Operations Research*,
September 1971.

721821

A Commonsense Approach to Questionnaires

This article, based on the author's experience with questionnaires in GAO, discusses some pragmatic approaches to effective use of the questionnaire as an audit tool.

Though the accounting profession has changed greatly since the days of the Mercantile Era, when "accounting" was little more than the division of goods and moneys from returning vessels among partners in sea-trading ventures, not all concepts in the discipline today are different from those in times past. Perhaps one of the most useful and increasingly used auditing tools common to both times is the questionnaire, broadly defined as a set of structured questions asked to ascertain information toward a goal. Certain structured questions were no doubt asked of the returning captain in, say, 1400, and the practice has continued and developed into modern times.

While we may associate the questionnaire today with such uses as the internal control checklist and confirmation of accounts with third parties, it may be more broadly applied to include, among other uses, structured interviews and structured questions to be answered from pertinent files under re-

view. Because the General Accounting Office deals increasingly with reviews of the effectiveness of Federal programs, it has become more expedient to gather some of the information needed to judge the efficiency, effectiveness, and economy of certain programs through questionnaires sent to recipient participants. The convenience of the questionnaire for this purpose and the economy of cost and time, as opposed to face-to-face interviews, for example, make it a valuable auditing tool.

There are disadvantages to such use of questionnaires, however. Among them are an almost certainty that not all questionnaires sent will be completed and returned and a loss of the flexibility offered through face-to-face interviews. Direct interface can perhaps offer avenues for receiving a better quality and more relevant set of answers to questions. Thus, use of the questionnaire requires a tradeoff of flexibility for savings in cost and time,

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and in this respect questionnaires should be used only when they compare favorably with other available alternatives for obtaining the desired information.

The ensuing discussion will be centered around design, control, tabulation, and verification of questionnaires used to query recipient participants in programs under review. While not intended to be a panacea, the discussion may provide an insight into some approaches. Of course, the ideas presented may also be applicable to other uses of questionnaires as well.

Considerations for Design

One of the first considerations in designing a questionnaire is the intended recipients, with respect to their education and experience, and "reasonably anticipatable" prejudices. In the first instance, general education and types of experience, as found in specialized employment, for example, determine the level of language to be used. The question "With what ultimate reliability do you believe the promulgation of the visual marketing tactics of X Program to be fraught?" may be reasonable, though pretentious, if directed toward persons having doctoral degrees in fields of business. For easier comprehension, however, the wording might be more appropriately changed to read "Did you find that Program X advertisements were true based upon your experience with the Program?"

The consideration of reasonably anticipatable prejudice deals with insight into sensitive information areas. No

question should be designed in such a manner as to arouse emotion from the reader. The question "Is your firm negligent in carrying out its responsibilities under Program X, and if so in what way?" is an illustration of what not to do in this respect. Use of such "colored" questions will tend to result in nonresponse or in a response which is not usable. A "no" answer is perhaps the best that one can expect for the above question, which forces a decision upon the respondent that he is apt to resolve in his favor, if at all. A more useful question would be "Through what methods does your firm carry out its responsibilities under Program X?" This question is fashioned on more neutral ground and will furnish the auditor with information upon which to make his own judgments concerning negligence—a point which is often taken for granted.

Another factor to be considered in designing questionnaires is the reasonableness of the questions. In addition to asking questions relevant to the audit objectives, one should ask only those questions to which accurate responses can be made, a task more easily discussed than practiced. A question such as "How many times in the last 5 years has your morning newspaper been delivered late or not at all?" is simple to ask, but it may prove difficult for oft-frustrated morning newsreaders to answer with any reliability. Similarly, to ask how many visits a program participant has had by program officials, when such visits are frequent, is not a question to which most participants would be able to respond accurately unless the time frame was both

current and narrow. Careful judgment should be made in this area of designing questionnaires, and this reasonableness of response concept should prevail over an idea that "the information would be nice to know."

Other considerations in design include length, number, and type of questions asked and logical flow of subject matter presented. It seems reasonable that the shorter and easier a questionnaire is to answer the greater is the chance that it will be completed and returned. Thus, questions should be as few and as directly to the point as possible, within the limitations allowed by the complexity of the information and the audit objectives. It may be wise, for instance, to consider sending two four-page questionnaires at different intervals than one eight-page questionnaire. Further, all questions should be spaced to allow respondents ample room for answers. Ten-line questions, single-spaced, are horrendous to behold and may well find their way into a waste container more quickly than into the mail.

Questions should be grouped by subject rather than asked at random, as well-organized subject matter is easier to comprehend and answer. References to "question 3(c), part iv, page 8 herein" are better left for inclusion in such things as the Internal Revenue Code. If the answer to one question depends upon the answer to another, the questions should be positioned in proper relation, one under the other. A simple numbering system for questions, with few subletters and subnumbers, is most desirable.

In determining the type of questions

to be used, the auditor may choose essay or more objective multiple-choice questions. The essay question allows greater latitude in answering but also requires more effort on the part of the respondent and may prove difficult to tabulate. The multiple-choice question requires less effort and is relatively easier to tabulate but may restrict the respondent in answering or may tend to prejudice his response by providing a ready answer.

Multiple-choice questions are best used when answers cannot reasonably be expected to be unique or can easily be grouped. Each should provide, whenever appropriate, an "other" choice so that the respondent may indicate, if he so desires, a choice different from those provided. Choices furnished should be mutually exclusive, and if groups of items are included in a choice, examples of items and/or explanations of terms in the group should be furnished. The choices "\$100-\$200" and "\$200-\$300" or "1-3 months" and "3-6 months" are not mutually exclusive and should not be found in a single question since \$200 is common to both choices in the first example and 3 months is in the second example. The choices should be described "\$100-\$199.99," "\$200-\$299.99," and "1-less than 3 months," "3-less than 6 months."

Essay questions, on the other hand, are best used when answers may reasonably be expected to be unique and cannot easily be grouped. It is a good idea to include, as a final question, one asking for any additional comments the respondents might care to make. This can serve as an added impetus for

some respondents to complete the questionnaire and a chance for the auditor to obtain pertinent information which might otherwise have remained unknown.

Regardless of the type of questions used, it is imperative that the flow of thought be clearly indicated. If the answer to one question is dependent upon the answer to another question, then, in addition to proper placement of one under another, the designer should be certain that the relationship is clearly, even overobviously stated. For example, witness the following set of questions.

1. Are you 45 years of age or over?
Yes___ No___ (Check one answer only.)

IF YOU ANSWERED "NO" TO QUESTION 1 PROCEED TO QUESTION 4. OTHERWISE, PLEASE ANSWER QUESTION 2.

2. Are you now receiving a social security pension? Yes ___
No___ (Check one answer only.)

PROCEED TO QUESTION 3.

The questions are explicit as to the direction the respondent is to take in completing them. Note that the number of choices to be marked is indicated as well. If only one choice is requested, it should be so stated. If two choices are to be marked, the statement "check two" should be made. If any positive number of choices is acceptable, "check one or more" should accompany the question. Care taken in these respects aids in minimizing conflicting answers, unanswered questions, and improperly marked answers. The designer must

weigh length against instruction in choosing an optimal combination of the two for a given complexity.

Controls: Physical and Attitude

The best designed questionnaires are of little value if they are not controlled. Little reliability can be placed on the evidence obtained if sending and receiving is not presided over by the auditor. An appropriate number of questionnaires should be prenumbered and then sent to respondents based on statistical methods for a given precision and confidence level, whenever possible; or a judgment sample, if scientific sampling is impractical, should be applied to a carefully chosen universe in harmony with the goals of the audit. Respondents' names and addresses should be keyed in a separate listing to the preassigned numbers for future reference in connection with verification.

Another control of sorts, important but often overlooked, is over the attitude generated by the cover letter to accompany the questionnaire. If the auditor does not display an interest in his document, the respondent may not either. A mere request to "fill out the enclosed document and return in the postpaid envelope" is better augmented with a statement of what is under review and, to the extent possible, a brief explanation of the source of initiation of the review and the reasons therefor, if appropriate, which may itself be more or less effective based on subtle wording. "Congress has requested that we, the General Accounting Office, its audit arm, obtain certain

information. . . ." may prove more impressive to some because of the relative warmth of the term "we" than an almost identical statement that "The General Accounting Office, an audit arm of the U.S. Congress, is currently engaged in a review of. . . ." although it may be argued with equal validity, perhaps, that the relative formality of the latter statement may make it more impressive to some. Careful consideration of the intended respondents and their relationship in the particular program under review is necessary to properly make such evaluations.

Another consideration in writing a cover letter, and one of utmost importance, is that the distinctive separation between the agency under audit and the auditor's agency be carefully and clearly presented to the respondents. Two possible situations which can arise contribute to this importance. First, if the respondents believe that they are answering the agency under audit, they may well respond based upon what they believe the agency would most like to read, believing such to be in their best interest, regardless of the veracity of the responses. Second, it is crucial for the respondents to have no cause to falsely believe that either agency is taking some action in connection with administration of the program for which the respondents may be waiting or hoping (such as false indication of a renewed interest in a previously disapproved loan application), regardless of the foundations for their doing so. Such mistaken ideas can cause hardship and friction between the agency under audit and the respondents and in turn

between that agency and the auditor. It is well for the auditor to request a responsible agency official to review a draft of a proposed questionnaire and cover letter to aid in alleviating such problems.

Problems in Tabulation

Perhaps one of the most difficult chores connected with questionnaires is the tabulation of responses. One format for setting up the workpaper favored by the author is to list the questions and the responses for each vertically and to place the predetermined questionnaire numbers horizontally at the top of multicolumn paper. It is always good to include as a choice "Question Not Answered" and to leave plenty of space between questions to enable addition of individual responses as necessary. Response totals or subtotals may be placed at the far right of the paper, and if more pages are needed the questions and responses can be photocopied and affixed to new pages so that they need be written only once.

Unfortunately, once the workpaper is set up the problems of tabulation are not ended, for it is almost certain that within some questionnaires inconsistencies and misplaced marks will be found. For instance, suppose a questionnaire has question 1 followed by question 2a, to be answered if question 1 was answered "yes," and question 2b, to be answered if question 1 was answered "no." It is conceivable that, among possible illogical combinations of responses, 2a was answered when 2b was expected, as would be the case if the respondent indicated "no" to

question 1 and then answered 2a. Or, in illustration of the misplaced mark, suppose the question "Did you use the funds from Program X to open a new business?" is checked "yes" with the parenthetical notation "(addition of cheese cakes to bakery goods offered for sale)." Both these situations have occurred and will continue to occur through human error and misunderstanding, and they pose a problem for the tabulator.

There are two possible views in such cases: one is that all answers should be tabulated as marked, the other that the answers should be tabulated in accordance with discernible accompanying expositions analyzed in light of the intent of the auditor in designing the question. Under the first view, responses are tabulated as indicated, and some symbol is used to indicate the inconsistency. Under the second view, responses are tabulated as perceived by the tabulator as being the intent of the respondent, with appropriate symbols used to indicate the deviation in tabulation. It is the opinion of the author that the first view is unsupportable. Such an approach will show little other than that respondents are capable of marking and interpreting errors, hardly a worthy conclusion unless the questionnaire was designed to confound the respondents, and will destroy otherwise useful data on the tremulous justification of "purity."

On the other hand, the second approach provides flexibility and allows maximum use of the data obtained. Under this approach our previously illustrated "inconsistency" situation would be rectified through a reading

of the narration in question 2a. It is reasonable to assume that the narration found there will support a "yes" or "no" answer to question 1 in most cases, and either question 1 would be changed to a "yes" response for tabulation, or the response to question 2a would be tabulated as a response to 2b, as appropriate. In our previously illustrated "misplaced mark" situation, if addition of the cheese cake is not regarded as a new business for purposes of the audit, then again, an appropriate tabulation adjustment would be made. Here the auditor may wonder how many other such line items were incorrectly believed to be new business by the respondents. If there is a reasonable doubt in his mind as to the materiality of such belief, then the question should have been more explicit in the first place and should not be tabulated and used as audit evidence. If there is no such doubt, then the tabulation change has added accuracy to the response and has merely corrected a misinterpretation, as would certainly have been done in a face-to-face interview. Thus, such interpretations by the tabulator may well prove more enlightening than distorting.

Verification of Results

After all questionnaires have been tabulated, two types of verifications may be made. The tabulation itself may be verified, and in many cases the responses themselves may be verified. In verifying the tabulation, it is merely a matter of someone other than the tabulator reviewing the questionnaires,

preferably on a random sample basis, and comparing them with the tabulation sheets to ascertain their correctness given the basic interpretive assumptions for tabulation, as previously discussed. In verifying responses, it is necessary to obtain supporting evidence from appropriate sources to corroborate responses. Such sources may include case files and receipt for disbursement documents.

Without verifications, the questionnaire is low-reliability evidence at best, as compared with direct documentary evidence, for instance. The more responses verified, the more convincing is the tabulation, and the value of any supplemental verification must be weighed against the associated costs in time and manpower.

Summary

We have seen that the questionnaire, used in connection with data gathering from recipient program participants, is a convenient cost- and time-saving audit tool. It is best designed with consideration of the education and experience, prejudices, and interpretive abilities of those to whom it is directed.

Questions should be reasonably capable of accurate answers and should present subject matter in an orderly and well-defined manner. Care should be taken in composing the cover letter to provide maximum interest by the participants without causing confusion as to identity between the auditor and the agency under audit.

Tabulation should be made with interpretation which will enhance the clarity of the results in terms of the goal of each question and of the questionnaire and audit as wholes. Verification of physical tabulation by a person other than the tabulator and verification of responses through reference to other available sources both increase the reliability of the results.

Once it is decided to use the questionnaire, its use and the degree of verification must be made on a trade-off basis between cost and time involved in relation to the audit goals and other available alternative means of gathering data. Such wise use of and considerations given to the questionnaire and its place in auditing provide the auditor with a useful and valuable audit device which may well become more and more popular in the future of auditing.

You Haven't Been Selected for the Military's Industrial College?

The author discusses the value of a graduate-level correspondence course designed for those wishing to broaden their knowledge of the management of resources for national security.

You say you believe in motherhood? You say that the need for GAO's professional staff to pursue a program of continuing education smacks of motherhood? You say that you don't have the time *now*, but maybe later? You say that many of your assignments concern DOD and that your thirst for education is in part directed to DOD's mission? Read on because I'm going to discuss a *now* graduate-level course, which I am currently taking, that you can pursue at a pace that you set! The course is the National Security Management correspondence course of the Industrial College of the Armed Forces.

The Sponsor

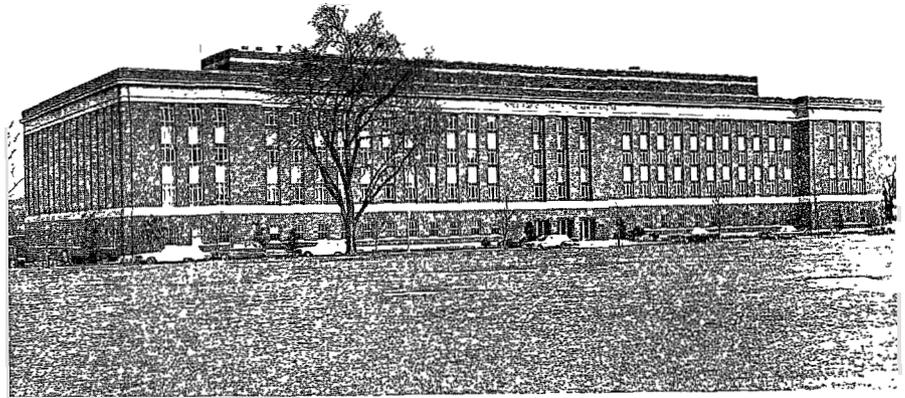
The Industrial College of the Armed Forces, one of the Nation's two senior

interservice colleges, operates under the direction of the Joint Chiefs of Staff. It operates from Fort McNair, Washington, D.C., and was founded in 1924. The principal activity is a 10-month resident course, offered each year to over 150 military officers and Government civilian executives. The College curriculum is directed toward national security with emphasis on the management of national resources under current and "crystal ball" environments.

The Course

The National Security Management correspondence course was adapted from the subject matter of the resident curriculum. It is divided into five parts, with each part graded separately. An average commitment of time

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ICAF Photo

Industrial College of the Armed Forces, Fort Lesley J. McNair, Washington, D.C.

will permit completion in 12-15 months. The course is open to GAO staff members, GS-11 and above.

To say that the course covers every conceivable facet of national security is undoubtedly a statement that could not be referenced by a GAO report reviewer. Yet the content of the course comes close to being that broad. This type of coverage is in fact the objective of the College; the course is not designed to train specialists in any particular field. It includes material designed to provide the student with knowledge of the economic and industrial aspects of national security and the management of resources in the context of both national and world affairs.

The first part looks at the role of the United States in concert with other nations; the second unit appraises our available resources for achieving security; the third discusses the framework

within which our national security is managed; the fourth unit introduces the student to the concepts, principles, and policies which give direction to DOD's managerial effort; and the last part deals with specific functional areas. The subject matter of each part is presented in five to six books of about 200 pages each. The authors are usually professors on the College's staff; however, chapters are often written by others, within as well as outside of Government, who have a particular expertise on the topic under discussion.

As I write this article, I am beginning the third part. The first two parts covered aspects of our world and nation that I did not envision would enter a course on national security management. For example, we studied crime and delinquency, patterns of social assistance programs, the farm income problem, and control of water

pollution. One chapter contains GAO's assessment of the war on poverty program. We also studied concepts and practices of modern management, systems of government, the nature of alliances, disarmament and arms control, and the future of U.S. foreign assistance.

As a reader might expect, much of the material is an analysis of national security and resource management under brush, conventional, and nuclear war conditions. Natural and energy resources and their strengths and limitations are examined, and the country's transportation network and problems of national policy and Federal regulatory efforts are viewed from their national security implications.

Examinations

Testing is done through a multiple-choice examination, each examination consisting of about 90 questions. The student submits a mark-sensed score-sheet at the end of each part. After grading, the College advises the student of the individual questions that were answered incorrectly. A passing score is 60 percent. If the student averages 90 percent for the entire course, he receives a special commendation. My experience to date indicates that the answers to the questions are not set out specifically in the text but rather require a thought and analysis process by the student.

Completion of the examinations has required rather intense reading of the subject material and, at times, rereading. In some weeks I made rapid progress and in other weeks very little. I

laid the course aside in July while our family vacation occupied the spotlight.

The College expects each part to be completed in 60 to 90 days, and thus each individual can complete the course either through a consistent level of effort over the 12 to 15 months, or by utilizing peak and valley levels of effort.

For You

In reflecting on the first half of the course, I can best express my views by stating that I am looking forward to the second half. The course is not only meeting my original objective, but is also providing me with information on the Taiwan-Mainland China issue, the fly-before-you-buy policy, and price and wage controls. Closer to my current workload, the material has covered such subjects as the military-industrial complex, the common aspects of the individual services recruit training programs, and the management of Government industrial property.

None of our professional staff need be reminded of the technology and information explosion. Experts are warning that a manager must continue his learning and development lest his knowledge become obsolete. To say that a particular way of updating and/or expanding learning is the best is risky. What is best for me, given my time, talent, and commitment, may not fit your situation. Yet, there are probably many in GAO who could visualize this course as an aid in his or her learning process. If you would like more information about the course, inquire of our Office of Personnel Management.

Don't Be So Sensitive

The author discusses his experience in a sensitivity training program and the benefits attainable through this type of activity.

There is a current rock tune which contains the lyric, "Take a look at yourself and you can look at others differently." Have you taken a close look at yourself lately? It seems unnecessary to say that the extent of our success in examining the management of Government operations is reliant upon our ability to meet and deal with others. This is applicable, of course, to our relationships both with agency officials and our fellow staff members.

This discussion of my experience in a sensitivity training group is aimed at describing some of the value which can be gained by individuals through this type of activity. Carl Rogers, in his book *On Becoming a Person* (Boston, Houghton Mifflin), describes a "helping relationship" between people whereby a state of understanding, trust, and acceptance is reached providing them with the insight and ability to be their true selves. This is what sensitivity training is aimed at—helping people to become more aware of themselves and how they interrelate

with others so that they may be more effective in interpersonal relations.

Devastation or Enlightenment?

I was, in part, prompted to write this article by the reactions of some of my associates when I told them I was in a sensitivity group. Most thought that such groups were only for people who needed help with emotional problems. I attribute that misconception to television which has a tendency to dramatize highly emotional moments in sensitivity groups. Actually, in my own group any dramatic moments appear so only in retrospect. Many of the incidents were so deep in meaning that their significance was not recognized at the moment of occurrence.

Some of my other associates told me that they feared being in a situation where they might find out about themselves. They doubted their ability to handle the truth. I must say that I experienced some of this same appre-

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hension, but as the sessions progressed I found myself looking forward with a sense of adventure to learning about myself. I found that the more I learned, the more capable I was of coping with everyday challenges. Rather than being a devastating experience, every time I uncovered something new about myself I felt a degree more unburdened and anxious to find more. Members of the group were quick to point out, for example, that I was defensive, at times, when my ideas were challenged. More important, through further discussion I was able to find that my defensiveness was caused by my own insecurities. Just recognizing that I was defensive, and why, has been enough to help me control this undesirable behavior, and even admit that there are times when my ideas are wrong.

It's Hard To Be Honest

I would like to describe my group and some of the happenings. My objective here is not to sell sensitivity training but rather to tell about it so that you may make up your own mind about its merits. The group met for 3 hours, one night a week, for 16 weeks. It consisted of seven professionals, each from a different segment of the business community, and one faculty facilitator. It was the facilitator's role to help the group work through difficult moments. He did not direct the line of conversation nor tell the group what specific topics to talk about. The only stipulation was that we had to talk about ourselves.

When we met on the first night I was admittedly quite anxious. But the first few meetings proved somewhat slow in pace and low in general interest. Most of the group sought to find issues for discussion—human rights, religious values, or other topics that they thought would be appropriate. But the facilitator was quick to remind us that those issues were only indirectly related to us as individuals and to our emotional abilities to function. This probably led to my first major realization—that it is extremely difficult for people to talk directly and honestly about themselves.

It was not until the fourth meeting that I felt a group cohesiveness begin to form. At that time some subtle change in the mood came about to bring a positive change in our progress. The members began to form the "helping relationship" which I spoke of earlier. There was no sudden change in the pace or content of the fourth session, but the group seemed somehow more relaxed and genuinely interested in providing the other members with feedback. I felt at this moment closer to those who freely talked about their shortcomings and hangups. It is refreshing to find a situation where people can admit their problems and receive an empathetic response rather than the attacks which often follow in the real world.

Freedom From Defensiveness

It appears appropriate at this point to state why it is so important in sensitivity training to be completely honest and open with one another. Permit me

| | | |
|--------------------------------|----------------------------------|-----------------------------------|
| | KNOWN TO SELF | NOT KNOWN TO SELF |
| KNOWN TO OTHERS | AREA OF FREE ACTIVITY I | BLIND AREA II |
| NOT KNOWN TO OTHERS | AVOIDED OR HIDDEN AREA III | AREA OF UNKNOWN ACTIVITY IV |

to refer to one person's conception of awareness as stated in an article entitled "*The Johari Window*" by Joseph Luft.¹ Mr. Luft presented the "Graphic Model of Awareness in Interpersonal Relations" shown above.

Let's say that the model shows the total of a person's behavioral characteristics. Quadrant I refers to that part of our behavior and motivation known to self and others. Quadrant II represents the part of our behavior where others can see facets of ourselves that we are unaware of. Quadrant III represents things we know about ourselves, but do not reveal to others (e.g., matters about which we have sensitive feelings). Quadrant IV is the area where neither the individual nor others are aware of certain behavior or motives, yet, their presence influences our relationships.

As Mr. Luft states, it takes energy to hide our motivations and reactions. He goes on to say that an increase in free

activity, Quadrant I, would imply less threat or fear and greater openness to information, opinions, and new ideas. Furthermore, the avoided or hidden area, Quadrant III, would be reduced by an increase in Quadrant I and less energy would be tied up in defensive actions.

Sensitivity training is an attempt to broaden the area of free activity. Certainly it is not intended to provide instant revelation or even changes in behavior which are readily observable by others. If the individual makes significant effort toward openness during the sessions he may be able to find out things about himself that he would not have otherwise known. He also may face undesirable personal characteristics that he had always realized, but had not had the courage to examine with others. These are healthy steps toward working creatively in the area of free activity.

Understanding Self-Control

There was a tendency in our group not to react, but rather to carefully

¹ Joseph Luft, *Group Processes* (Palo Alto, Calif., National Press Books, 2d ed., 1970). Reprinted by permission. *The Johari Window* is further described in *Of Human Interaction* by the same author (Palo Alto, Calif., National Press Books, 1969).

consider beforehand the impact of each of our statements. A foremost characteristic was a general inability to express emotional reactions until several minutes after the reaction was experienced. For example, if one person said something which touched off anger in a second person, this anger was seldom shown right at the moment it was experienced. Rather, several minutes later, after a cooling-off period, the person angered would feel moved to tell of his anger.

It takes a great deal of *control* to suppress emotions in this way. This control has been drilled into us since we were little children; ever since our fathers told us, for example, "Big boys don't cry!" Control, to a certain extent, is quite necessary in life. Without it mankind would probably revert to uncivilized behavior. However, sometimes the emotional control we have acquired is so deep that we are unable to realize when we are experiencing an emotion, and these suppressed emotions can become redirected in unconstructive ways. Sensitivity training can provide participants with the insight they need to understand their emotions and thereby gain a better grasp of situations and the action which would be most appropriate.

Since it would be inappropriate here to discuss particular personal problems of the group members, it is difficult to completely describe some of our deeply moving experiences. There was one session where a problem being discussed was so emotionally arousing that the man describing the problem almost cried. He said he wanted to cry,

and I am sure that it was only his control which kept him from it. We became valuable as listeners. Only the man experiencing the problem could find the solution. Compare this situation with a man who is completely upset because he just smashed up his new car, and his friend says to him, "Don't worry about it." His friend would have been much more valuable had he allowed the person to talk about it for awhile.

So What?

So now your question may be "So what?" "What did you personally get out of this experience?" I can only say that I doubt that my associates have noted any significant changes in my behavior. The difference is what I feel myself. I feel more comfortable debating controversial issues with agency officials and, since I understand myself better, I have learned how I come across to others. By gaining self-insight, I also found that I could better understand the reactions of others, and now find it easier to cope with responses I previously found surprising.

I guess what most of us are aiming for in life is to be "the truly functioning person" by increasing our ability to objectively gain from our experience, having self-trust and the objectivity to see ourselves as others see us. All this should lead to greater creativity, absence of defensiveness, fulfillment of our personal objectives in life, and the general ability to cope better with everyday problems.

Conclusion

I would like to summarize by using a quote by G. F. J. Lehner, professor of psychology, University of California at Los Angeles:

Some of the most important data we can receive from others (or give to others) con-

sists of feedback related to our behavior. Such feedback can provide learning opportunities for each of us if we can use the reactions of others as a mirror for observing the consequences of our behavior. Such personal data feedback helps to make us more aware of *what* we do and *how* we do it, thus increasing our ability to modify and change our behavior and to become more effective in our interactions with others.

A Supervisor's Prayer

Dear Lord, help me to become the kind of audit supervisor my management would like to have me be. Give me the mysterious something that will enable me at all times satisfactorily to explain policies, rules, regulations, and procedures to my staff even when they have never been explained to me.

Help me to teach and train the uninterested, disinterested, dimwitted and slow witted without ever losing my patience or my temper. Give me that love of my fellow men which passeth all understanding so that I may lead the recalcitrant, obstinate, no-good auditor into the paths of righteousness by my own example, and my soft persuading remonstrance, instead of busting him in the nose. . . .

Teach me to smile if it kills me.

Make me a better leader of men by helping me develop larger and greater qualities of understanding, tolerance, sympathy, wisdom, perspective, equanimity, mindreading, and second sight.

And when dear Lord, Thou has helped me to achieve the high, high pinnacle my management has prescribed for me and when I shall have become the paragon of all supervisory virtues in this mortal world—dear Lord, move over.

Amen.

Authorship Unknown.

Reorganization in GAO

On January 25, 1972, the Comptroller General, *Elmer B. Staats*, announced a major realignment in GAO's organizational structure, to be effective April 3, 1972.

The last major change in GAO's organization occurred in 1956 under Comptroller General *Joseph Campbell*. At that time, the functions of the former Division of Audits (which had been formed in 1952) and the former Accounting Systems Division (established in 1948) were combined and five new organizational units formed:

- Civil Accounting and Auditing Division
- Defense Accounting and Auditing Division
- Field Operations Division
- Accounting and Auditing Policy Staff
- Office of Staff Management

Not long after these changes were made, the former Office of Investigations (originally established in 1922) was abolished and its functions assigned to the above five organizations.

In 1963, the International Operations Division was created to handle accounting and auditing work relating to international programs.

In 1966 the names of the Civil and Defense Accounting and Auditing Divisions were simplified to Civil Division and Defense Division, and the International Operations Division was

renamed the International Division. At the same time, the Accounting and Auditing Policy Staff was renamed the Office of Policy and Special Studies and the Office of Staff Management was made a part of that office. In 1968, the staff management functions were combined with those of the Office of Personnel which was renamed the Office of Personnel Management.

As reported in the Fall 1971 issue of the *Review*, the Office of Policy and Special Studies and the Program Planning Staff (set up in 1967) were replaced as of July 1, 1971, by the Office of Policy and Program Planning and the Financial and General Management Studies Division. At the same time, the new function of internal review was added to the Office of Policy and Program Planning.

Outline of New Organization

The principal changes in organization announced on January 25, 1972, are outlined below.

1. The Civil and Defense Divisions are discontinued and replaced by six new audit divisions, each having Government-wide responsibility for assigned programs or functions. These six new divisions and their principal assignments are:

—Logistics and Communications Division:

Defense supply management, maintenance, transportation, warehousing, communications, facilities services, and military housing, GSA (except procurement), GPO, and Office of Telecommunications Management.

—Procurement and Systems Acquisition Division:

Defense R&D, weapons systems, and procurement, central DOD overhead agencies, GSA procurement, NASA, AEC procurement, and Renegotiation Board.

—Federal Personnel and Compensation Division:

Civil Service Commission, Federal retirement systems, manpower utilization and productivity, Federal training program studies, pay and fringe benefits, and Defense manpower.

—Manpower and Welfare Division:

HEW, Government health programs, Department of Labor, VA, RRB, OEO, NSF, and Smithsonian.

—Resources and Economic Development Division:

Agriculture, Interior, Transportation, Commerce, SBA, HUD, EPA, AEC, Corps of Engineers (civil functions), TVA, and Appalachian Regional Commission.

—General Government Division:

Postal Service, Treasury, Justice, judiciary, regulatory agencies, legislative branch, D.C. Government, and Executive Office of the President.

2. Responsibility for GAO reviews

of accounting systems in operation (previously vested in the Civil, Defense, and International Divisions) is centralized in the Financial and General Management Studies Division.

3. The Transportation and Claims Divisions are consolidated into a single division, and the transportation and traffic management review function is reassigned to the new Logistics and Communications Division. This change has two objectives. One is to concentrate all aspects of Government logistics—including the related functions of transportation, warehousing, distribution, and inventory control—in one audit division. The other is to provide better long-term opportunities for the utilization and development of the personnel assigned to the important claims and transportation payment audit functions.

4. The Field Operations Division remains unchanged, but it is assigned responsibility for scheduling and executing financial settlement work (including civilian and military pay) and certain recurring financial audits as assigned. Initial assignments include (1) Government corporations such as FDIC, FCIC, FPI, FSLIC, St. Lawrence Seaway Development Corp., Federal Home Loan Bank System, Panama Canal Company, and GNMA, (2) other agencies such as Canal Zone Government, Bureau of Engraving and Printing, Veterans Canteen Service, and Student Loan Fund, and (3) other organizations such as GSI and Gorgas Memorial Institute.

5. The International Division remains unchanged, except that responsibility for review of accounting systems

in operation is assigned to the Financial and General Management Studies Division.

6. Three new positions of "Assistant Comptroller General" are established.

—One of these supersedes the present position of Director, Office of Policy and Program Planning. Three new offices are established under this Assistant: the Office of Policy, the Office of Program Planning, and the Office of Internal Review.

—One Assistant Comptroller General is responsible for:
 Financial and General Management Studies Division
 Logistics and Communications Division
 Procurement and Systems Acquisition Division
 Federal Personnel and Compensation Division

—The other Assistant Comptroller General is responsible for:
 General Government Division
 Resources and Economic Development Division
 Manpower and Welfare Division

The latter two Assistant Comptrollers General are to be full line representatives of the Comptroller General, responsible for overseeing and assisting the divisions assigned to them. However, it is intended that the division directors have maximum latitude in identifying the most fruitful audit areas; preparing and executing audit plans; preparing final reports; defending their reports before review groups; and representing GAO to the Congress and to top agency officials.

7. A new Office of Federal Elections is established to discharge the Comptroller General's responsibilities under the Presidential Election Campaign Fund Act and the Federal Election Campaign Act (see p. 68).

The chart on page 65 depicts the broad outlines of the new organizational structure and identifies the designated heads of all divisions and offices.

Reasons for Change

In February 1971, the Comptroller General appointed a high-level organizational study committee under Deputy Comptroller General *Robert F. Keller* to study GAO's organization structure. Other members of this group were:

Charles M. Bailey, director, Defense Division

A. T. Samuelson, director, Civil Division

Oye V. Stovall, director, International Division

Thomas E. Sullivan, director, Transportation Division

John E. Thornton, director, Field Operations Division

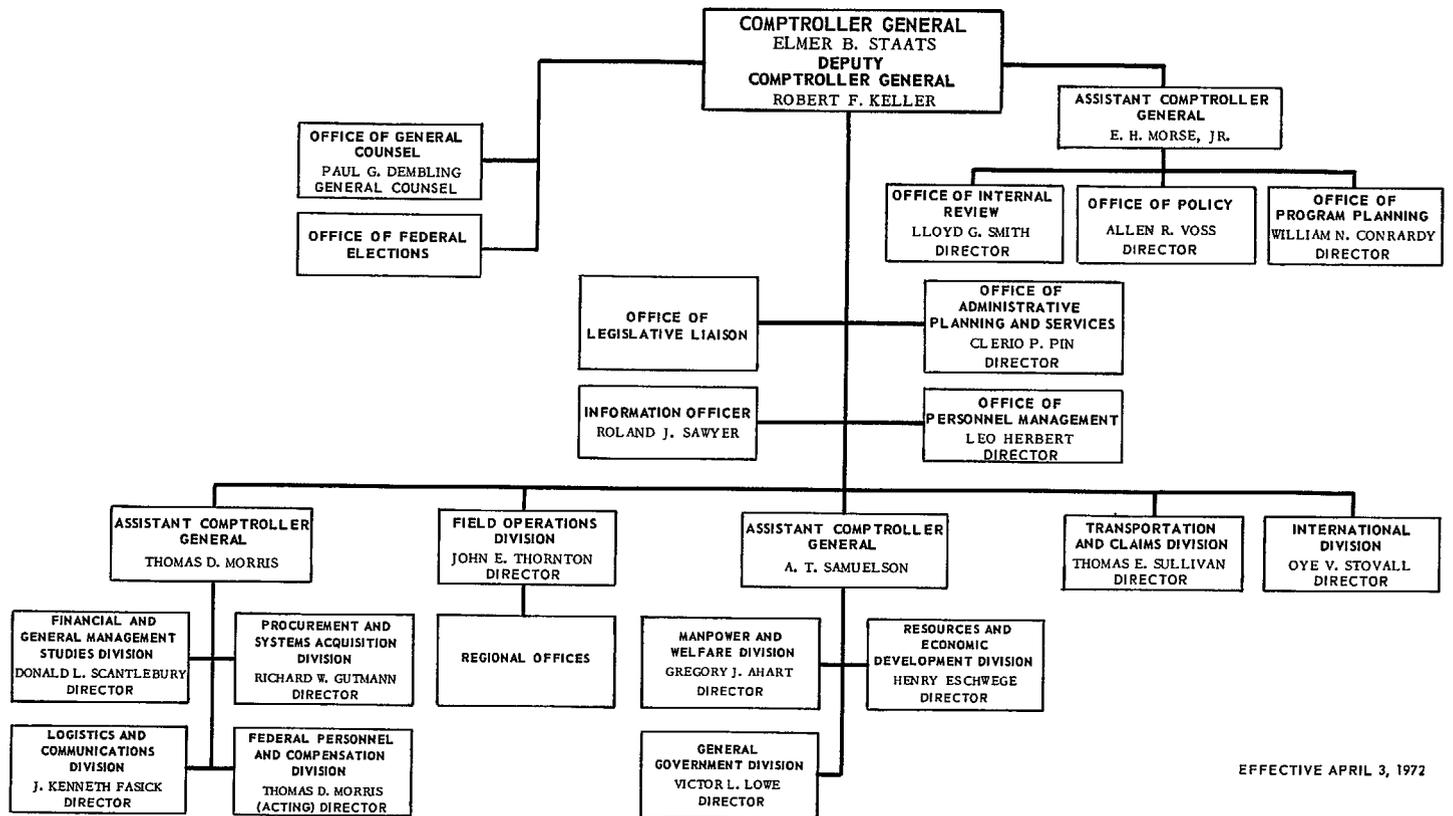
James M. Campbell, director, Claims Division

Joseph Eder, regional manager, Boston

One conclusion of this committee was that "the accounting and auditing divisions of GAO should ultimately be organized on a Government function and program basis."

The Comptroller General agreed with this conclusion and, in announcing the changes decided upon, referred

ORGANIZATION OF THE UNITED STATES GENERAL ACCOUNTING OFFICE



EFFECTIVE APRIL 3, 1972

to the following four benefits expected to be achieved:

—*First, accelerate the growth of program and functional expertise among our senior staff.* If we are to respond to the demands for broad-based and program-type reviews, our senior staff must achieve a high degree of specialization in the subject matter of the areas assigned to them. We began moving in this direction in the Defense Division in 1966 when Operating Groups were established in functional areas such as Manpower, Procurement, Research and Development, etc. The Civil Division is now adopting this approach in selected fields.

I agree with the Keller Committee that our future divisional structure should be based primarily upon either program or functional orientation. I also believe that the Director, Deputy, Associate, and Assistant Directors of these divisions should increasingly be subject matter experts, as well as highly skilled in planning, conducting, and reporting broad-based reviews.

—*Second, provide more opportunities for staff growth and advancement.* To do the quality of work, and make the creative contribution which is being demanded of GAO, we need to attract and retain professional personnel with outstanding capabilities and motivation—and to expand the opportunities for their advancement. I believe that our present divisional structure unnecessarily limits such opportunities. Congress has recently granted me authority to appoint up to five Executive-level Assistants in addition to our regular supergrade allocation. This new authority, plus the establishment of more divisions, will enable us to create additional positions at the Associate Director level and above.

—*Third, facilitate the timely completion of our work.* The increased demands on Washington Operating Divisions tend to delay the timely completion of audit reports. Recent studies show that as much as one year elapses after completion of

work in the field before the issuance of reports to the Congress. By creating more divisions to oversee the planning and execution of surveys and reviews, in collaboration with the regions, I believe that we can accelerate the completion of our reports.

—*Fourth, assist the Comptroller General to deal with his expanded responsibilities.* At the same time that the variety and complexity of our accounting and auditing responsibilities have been increasing, the Comptroller General and his immediate office have become involved in new and important but very time-consuming responsibilities—the Cost Accounting Standards Board, the Procurement Commission, the Presidential Campaign Fund Act and the Federal Election Campaign Act. These assignments are either not delegable, or they require the Comptroller General's personal attention. Hence, the Comptroller General needs additional top-management support in order to discharge his responsibilities effectively.

Procurement and Systems Acquisition Division

Another of the recommendations of the Keller Organizational Planning Committee was that GAO establish a separate division concerned with Government procurement. This recommendation was accepted by the Comptroller General in November 1971 (*The GAO Review*, Winter 1972).

A special public announcement on the formation of this new division was made January 25. The Comptroller General stated:

Federal procurement in fiscal year 1971 totalled nearly \$50 billion. This is a highly significant portion of the total Federal budget. It is extremely important that procurement activities be carried out as economically and efficiently as possible and that the Federal

agencies follow common procurement practices wherever feasible.

By bringing into a single division GAO activities affecting Federal procurement operations—principally the Department of Defense, the General Services Administration, the National Aeronautics and Space Administration, and programs of other agencies involving substantial procurements, including acquisitions of major systems—we believe we can do a better job for the Congress and the taxpayer.

There has been a growing interest in the Congress in recent years in the subject of Federal procurement as evidenced by the establishment of the Commission on Government Procurement in 1970 to review Government policies, practices and procedures affecting procurement of goods and services for its own use. It is expected that the Commission—on which the Comptroller General serves as a statutory member—will be making recommendations to the Congress towards the end of this year.

Establishment of a separate procurement division at this time will provide GAO with a central group of experts concerned primarily with conducting audits and recommending improvements in Government procurement procedures, practices and organization. This should increase GAO's capability to follow through and assist the Congress in reviewing the Procurement Commission's recommendations.

* * * * *

The division will have three major responsibilities.

- a. Evaluate and report on the effectiveness of Government-wide policies and practices covering contracting and contract administration.
- b. Review and report on the activities of the principal Government agencies concerned with procurement, related research and development, and the acquisition of hardware and supplies.
- c. Provide assistance to other GAO audit divisions on procurement matters.

New Responsibilities for GAO Relating to Federal Elections

Two laws came into being in recent months which inject the Comptroller General of the United States and the General Accounting Office into new machinery for financing and controlling campaign expenditures for Federal elections. Although these added responsibilities involve such functions as accounting, financial reporting, and auditing in which GAO is well versed, they are to be applied in a field which is new to GAO operations.

It is planned that a new Office of Federal Elections will be established in the General Accounting Office to carry out these new duties.

A résumé of the main requirements of these laws as they affect GAO follows.

Federal Election Campaign Act of 1971

This act was signed into law by President Nixon on February 7, 1972, and becomes effective on April 7, 1972. It requires GAO to prescribe regulations for implementing title I, which provides spending limitations for the use of communications media by or on behalf of candidates for Federal elective office. Communications media are defined as meaning broadcasting stations, newspapers, maga-

zines, outdoor advertising facilities, and certain uses of telephones.

It also requires GAO to serve as a national clearinghouse for information on the administration of elections, including the award of contracts for special studies.

Title III of the act is concerned with disclosure of Federal campaign funds. It requires the Comptroller General as "supervisory officer" for candidates for Federal office, other than congressional, to:

- Prescribe regulations, reporting forms, and an accounting manual for guidance of candidates and political committees in filing organization statements and in recording, accumulating, and reporting their contributions and expenditures applicable to general, special, primary, and runoff elections.
- Receive, file, code, cross index, make available to the public, and maintain for 10 years reports required to be filed under the act.
- Compile and furnish to the Public Printer an annual report on each political committee filing a report(s) each year.
- Publish and assure wide dissemination of (1) an annual report including specified compilations

of contribution and expenditure data based on the reports received, and (2) certain special reports issued from time to time. This will require the use of computers to process the large volume of data.

- Make audits and investigations from time to time of reports and statements filed and on alleged failures to file.
- Investigate complaints and other indications of problems and refer cases to the Attorney General, as appropriate, for his action.
- Encourage and cooperate with State election officials to develop uniform reporting procedures.

The Secretary of the Senate and the Clerk of the House have similar responsibilities under title III for candidates for seats in the Senate and House of Representatives.

Special GAO Task Group

Since 1972 is a Federal election year and this act was to become effective in 60 days after signature, a special GAO task group was established early in January 1972 to begin work on the required regulations to be followed by candidates.

The Comptroller General appointed the following staff members to this group:

L. Fred Thompson, Office of Legislative Liaison, Chairman
Robert L. Higgins, Office of the General Counsel
Harry C. Kensky, Office of Policy and Program Planning

Howard R. Davia, Division of Financial and General Management Studies

Robert W. Benton, Data Processing Center, Office of Administrative Planning and Services

Sanford H. Cornett, Budget and Finance Branch, Office of Administrative Planning and Services

Richard T. Sampson, Organization and Management Planning Staff, Office of Administrative Planning and Services

Presidential Election Campaign Fund Act

This act was approved by President Nixon on December 10, 1971. It provides for tax credits for contributions to political parties by taxpayers and the so-called tax check-off whereby a taxpayer could designate \$1 of his tax payment (\$2 for joint returns) to go to a political party. This check-off procedure does not go into effect until January 1, 1973.

GAO's responsibilities under this act are to:

- Certify to the Secretary of the Treasury for payment to presidential and vice presidential candidates the amounts to which they are entitled under the check-off procedure.
- Audit candidates' reports of campaign expenses.
- Report to the Congress on payments to political parties and campaign expenses.
- Seek recovery of funds from candidates based on determinations

as to ineligible receipts or campaign expenses.

This act also requires the establishment of a Presidential Election Campaign Fund Advisory Board of 11 members to "counsel and assist the

Comptroller General of the United States in the performance of the duties and functions imposed on him" by the act. Four of these members (two from each major political party) are to be appointed by the Comptroller General.

GAO's Evaluation Mission

GAO's mission is traditionally to evaluate the effectiveness of Federal programs in achieving the objectives intended by the Congress and to facilitate efficiency and economy in the administration of these programs. It can also be helpful to the administrators by informally calling to their attention tendencies or situations which suggest trouble spots. Evaluation should be more than surveillance and monitoring. In its creative expression the prime objective is to facilitate as quickly and effectively as possible the delivery of services. Evaluation organizations should not hesitate to speak with administrative agencies since the real objective of their effort is not to occasion censure but to encourage positive results. Such contact would also weaken the all-too-frequent feeling on the part of departments and agencies that GAO is engaged exclusively in adversary proceedings.

Robert C. Weaver

Professor of Economics, City University of New York.

Speaking on "Management of Urban Programs," during the GAO 50th anniversary lecture series, June 11, 1971.

Central Audit of Transportation Bills By GAO

One of the landmark studies conducted under the Joint Financial Management Improvement Program was the joint agency transportation study, completed in December 1969. This study was carried out by representatives of the General Services Administration, the Bureau of the Budget, the General Accounting Office, and the Departments of Commerce, Agriculture, the Treasury, and Health, Education, and Welfare. The report on the study contains numerous recommendations for improving procedures for procuring, paying, auditing, and settling civil agency freight and passenger services.¹

One of the subjects examined was the possibility of alternatives to GAO's centralized rate audit of carriers' bills.

The Transportation Act of 1940 requires Federal agencies to pay bills for transportation services by carriers subject to the Interstate Commerce Act and the Federal Aviation Act on presentation prior to audit by GAO. After payment, they are sent to GAO's Transportation Division in Washington, D.C., where they are audited to determine their validity and propriety and conformity with tariffs, quotations, agreements, and tenders. Overcharges detected are taken up directly

¹ The report is for sale by the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, for \$1.50 per copy.

with the carriers. Collections by GAO are deposited back to the agencies' appropriations, if possible, or to miscellaneous receipts. This basic pattern of audit has existed for over 30 years.

The JFMIP study group concluded that the existing system of central postaudit and settlement of transportation bills is the most beneficial to both the Government and the carriers and recommended that central GAO audit and settlement be continued. However, it also urged that continued emphasis be placed upon systems development in the agencies to attain maximum audit coverage through computer and other techniques and to reduce manual reviews of individual transactions. The objective here is to progressively change GAO's role to that of assessing agency procedures under which audit is performed as an outgrowth of agency payment procedures and thereby reduce the transmission of transportation documents for central audit in GAO.²

In addition to the "look of the future" provided by the study insofar as future GAO audit of transportation bills is concerned, the report contains

² In January 1972 a joint DOD-GAO Transportation Audit Committee was formed to determine the feasibility and desirability of performing the technical rate audit of transportation payments concerning Department of Defense traffic as a by-product of the traffic management and logistics systems of the military services.

a good review of the historical evolution of the present system which is of interest. Excerpts follow.

Audit and Settlement Situation, 1905-1921. As far back as 1905, the Treasury Department was considering ways of improving the transportation audit. In that year the Treasury Auditor for the War Department established a board for the purpose of maintaining a central transportation tariff file for the use of all Treasury auditors.

The actual audit of transportation charges, along with all other transactions, had been divided among six Treasury auditors (War, Navy, Interior, Treasury, Post Office, and State and other Departments). In order that actions taken by the six Treasury auditors might present a uniformity and consistency not previously obtained, a recommendation was made by a committee of investigation:

* * * that the clerks in the office of the various auditors now engaged in the examination of transportation accounts be assigned in one place, and that they be provided with and that there be maintained a complete common file of tariffs, schedules, and division sheets for the use of these representatives of the several auditors. * * *

Pursuant to this recommendation, a central transportation audit organization was set up under the control of the Comptroller of the Treasury which became known as the Transportation Rate Board. This Board centrally audited the Government's transportation disbursements and claims.

Budget and Accounting Act, 1921. With the passage of the Budget and

Accounting Act of 1921 establishing the General Accounting Office (GAO), many of the functions of the Comptroller of the Treasury were taken over by GAO. Among these were the functions of the Transportation Rate Board which subsequently were transferred to the Transportation Division of the GAO.

By July 1, 1923, the Transportation Division had 125 employees and a tariff library containing over 250,000 tariffs and other publications. That same year GAO issued regulations directing, with certain specified exceptions, that all claims and demands of common carriers should be transmitted to GAO for settlement after the agencies had performed their administrative examination but before payment was made. This procedure was initiated to establish a uniform method of settling all transportation accounts and to provide for an audit by GAO of the charges before payment.

Apparently some agencies never fully complied with these regulations. As late as 1939 the Comptroller General in his annual report referred to the "unnecessary and expensive duplication of work" resulting from agencies performing their own audit of transportation accounts. Because of this lack of full compliance GAO was performing:

1. Prepayment rate audits on some agencies' transportation accounts.
2. Postpayment rate audits on other agencies' accounts.
3. A combination of the two on other agency accounts.

Payment Delay Situation in 1937 and 1938. With the increase in Government programs during the 1930's and the related increase in Government use of transportation, the volume of carrier bills increased resulting in severe delays in audit, settlement and payment of carrier bills.

In an exchange of correspondence between the GAO and the Treasury Department in November and December 1937 it was indicated that the average time from receipt of a carrier's bill to payment was between 80 and 90 days. To expedite payment, Treasury suggested that carriers' bills should be administratively examined by agencies, paid, and then should be post-audited by GAO as to the correctness of the rates and charges.

While not approving this procedure, the Acting Comptroller General stated that he would interpose no legal objection. He indicated that he had no authority to relieve the administrative and disbursing officers of liability for overpayments resulting from erroneous or unauthorized rates.

Apparently the proposed procedure was not implemented until after the Transportation Act of 1940 became effective.

In 1938 the Association of American Railroads complained to Congress that the Government owed the railroads about \$11.8 million which had been outstanding 60 days or more, \$5 million of which had been outstanding over six months. As the below data indicate, rail amounts outstanding 60 days or more were about 20 percent of the Government's annual expenditure.

Similar data on other modes are not readily available.

PAYMENT SITUATION IN 1938

| | <i>Millions</i> | <i>Percents</i> |
|--------------------------------------|-----------------|-----------------|
| Total annual Government expenditures | \$60.0 | 100.0 |
| Rail amounts outstanding | | |
| 60 days or more | 11.8 | 19.7 |
| over 6 months | 5.0 | 8.3 |

The Transportation Act of 1940. Records of Congressional hearings held in 1938 contain a proposal by the General Counsel of the Association of American Railroads that legislation be enacted to the effect that transportation bills be paid by the Government upon presentation and prior to audit or settlement by GAO. Legislation substantially the same as this proposal eventually was enacted as Section 322 of the Transportation Act of 1940 (49 U.S.C. 66).

This legislation, which remains in effect today, provides the basis for the present system whereby:

1. An administrative examination of transportation bills is performed by agencies before payment.
2. The technical audit of rates and charges is performed by GAO after payment.

Certifying and disbursing officers were relieved of liability for overpayments due to the use of improper rates by legislation effective December 29, 1941, and June 1, 1942. (31 U.S.C. 82g)

* * * * *

Expedited Audit Production Techniques. Over the years, a number of audit production techniques have been introduced. The basic approach adopted is to concentrate the rate specialist's time on areas and transactions which provide the greatest potential overcharge return. Low cost surveillance is maintained over the balance of the areas to ensure that nothing of significance is overlooked.

One indication of the effectiveness of these techniques is that in fiscal year 1969 audit and settlement recoveries were \$16,970,000 while related costs were \$6,086,100—\$2.79 was recovered for every dollar spent.

The following compares the 1938 payment situation, prior to passage of the Transportation Act of 1940, with

the payment situation in Fiscal Year 1969. It is apparent that under the present postaudit system the carrier's accounts receivable picture has greatly improved.

| | 1938 <i>Preaudit</i> | 1969 <i>Postaudit</i> |
|--|-------------------------|--------------------------|
| Average Days to Pay Bill | 85 | 20 |
| Annual Government Transportation Expenditures (Millions) | \$60.0 | \$1,800.0 |
| Outstanding 60 Days or More (Millions) | \$11.8* | \$ 3.9 |
| Percent of Total | 19.7 | 0.2 |

* Represents only amount outstanding to rail carriers; however, in 1938 the railroads carried the vast majority of Government traffic.

FROM GAO SPEECHES

Maxims for Information Systems

Donald L. Scantlebury, director, Division of Financial and General Management Studies, speaking on "Making Information Systems Responsive to Management Needs" at the Data Processing Management Association Conference, Chicago, Ill., November 11, 1971:

I would not lay the responsibility for the problems existing in top management information systems all on data processing people. Far from it, top managers as a class have not been willing to devote much time or effort to determining what information they need and this is essential if really effective information is to be provided to them.

They must be willing to devote some time and energy to determining what information they need to manage with if they are to get really useful information. Data processing people can automate what the manager already has but they cannot effectively determine what additional information the manager needs or could use to do his job better without his help.

* * * * *

* * * an outsider, and in this case a data processing specialist is an outsider, can't know all of the factors that a top manager must bring to bear when making decisions. Only the manager himself can spell out what factors are pertinent and thus what he really needs to make decisions. The data processing specialist may help the manager by suggesting techniques and alternatives but if

the managers do not provide their input, the odds are heavily in favor of the system being a failure.

* * * * *

Not unlike many complex problems, coming up with a plan for solving this one is far easier than actually solving it. The planning isn't as hard as the implementation. First and foremost, I think data processing specialists must make a concerted effort to convince top management that their involvement in planning what information the system should turn out, and in what format, is essential to the development of a really useful information system.

Second, data processing specialists direct their talents and skills toward reducing the size and scope of the reports top management gets to what is really essential. Some things you can do along this line are:

- Avoid overly complex systems that users can't understand and use.
- Build in flexibility and the ability to respond reasonably quickly to one-time requests for information already in the data base.
- Consider massive reports as an indication of incomplete systems work.
- Follow up to see whether reports produced are useful and to determine how they can be improved.
- Make maximum use of "exception" or "out-of-line" reporting.

Basic GAO Audit Objective

Gregory J. Ahart, deputy director, Civil Division, speaking on the role of

the GAO in auditing grant and contract programs at the National Graduate University Institute on Grants, Contracts, and Other Federally Funded Projects, Washington, D.C., October 5, 1971:

Since our resources are quite limited, it is not possible for us to comprehensively review every Government activity on a continuing basis. Also, it is not possible to make

each review in sufficient depth and scope to permit an overall judgment on whether a particular program or a particular agency is well managed, reasonably well managed, or poorly managed. Of necessity, we must look for opportunities to improve management, and utilize our resources where we believe we can make the greatest contribution. In short, it is our basic objective to promote constructive improvement in Government operations.

Six Mistakes of Man

These six mistakes of man were expressed 2,100 years ago by Cicero, the Roman philosopher and orator:

1. Believing that individual advancement is made by crushing others.
2. Worrying about things that cannot be changed or corrected.
3. Insisting that a thing is impossible because we cannot accomplish it.
4. Refusing to set aside trivial preferences.
5. Neglecting development and refinement of the mind, and not acquiring the habit of reading and study.
6. Attempting to compel other persons to believe and live as we do.

Cited in *The Utah CPA Newsletter*
and *The Journal of Accountancy*,
October 1970.

The amendment to the Defense Production Act of 1950 passed in August 1970 which provided for the establishment of the Cost Accounting Standards Board designated the Comptroller General as Chairman and authorized him to appoint the other four members. The law further specified that two of the additional members are to be from the accounting profession; one is to be representative of industry; and one is to be from a Federal department or agency.

Accounting Standards Board (Public Law 91-379) was passed by the Congress following an 18-month study by the General Accounting Office undertaken by previous direction of the Congress. In this study GAO found that such standards were both feasible and desirable. The new establishment of the Board was then incorporated in the amendments to the Defense Production Act, approved August 15, 1970. Funds for the establishment of the Board were approved recently by the Congress.

On March 5, 1971, Mr. Staats, Chairman of the Board, announced that the Board had selected Arthur Schoenhaut as Executive Secretary.

Mr. Schoenhaut has served the Federal Government since 1950. Until 1958 he was with the General Accounting Office and served as Deputy Director of the Civil Division from 1964 to 1967. Since 1967 he has been Deputy Controller of the Atomic Energy Commission.

Mr. Schoenhaut received his B.B.A. degree from the City College of New York.

Kudos

Written expressions of appreciation for the quality of assistance rendered by GAO staff members are frequently received. The *Review* is glad to present excerpts from some recent ones.

From the Director, Program Operations, National Urban League, concerning *William L. Campfield*, associate director, Office of Policy and Program Planning, December 13, 1971:

* * * Thank you for U.S. General Accounting Office involvement, and the participation of William Campfield, in BEEP/Auditing and BEEP/Contemporary Problems in Accounting.

We consider the presence and professionalism of each participant to be a major factor in the success of the Black Executive Exchange Program. The report from faculty and students at Southern University in New Orleans, and Southern University in Baton Rouge, indicates that Mr. Campfield's lecture was not only interesting and informative, but inspirational as well. They felt that his preparation and presentation of the content reflected great credit upon himself, as well as to the U.S. General Accounting Office.

From Representative Robert N. C. Nix, chairman of the Subcommittee on Postal Facilities and Mail of the House Committee on Post Office and Civil Service, November 5, 1971:

I have worked with, and my staff has had the pleasure of working with, Mr. Frank Medico, Mr. Calvin Cookfair, Mr. John Murphy and Mr. Paul Blackmer. If these men are typical of your organization it is no wonder that the General Accounting Office has an outstanding national reputation. They are able and experienced. In the time we have worked together there has not been an occasion when any question of ours has not been answered fully. My staff and I feel that with their help, all our own work has improved greatly.

From Representative Wright Patman, chairman of the House Committee on Banking and Currency, December 6, 1971:

Mr. John Kunzler, who was assigned by your office to assist the Committee in its study of tax-exempt foundations and charitable trusts, has completed his service and returned to his regular duties at GAO.

Mr. Kunzler's work for the Committee has been exemplary. He provided invaluable assistance in analyzing the tax returns of over 22,000 private foundations. He worked closely with data processing personnel in having the information from these tax returns processed and programmed. Mr. Kunzler also assisted in the preparation of the Committee report on the effect of the Tax Reform Act of 1969 on the fifteen largest foundations.

On behalf of the Committee, I express my appreciation to you and Mr. Kunzler for a job well done.

From the Special Counsel, Subcommittee on Labor of the Senate Commit-

tee on Labor and Public Welfare, concerning *Homer W. Anderson*, supervisory auditor, Civil Division, December 2, 1971:

Mr. Anderson participated in the Subcommittee's investigation of the United Mine Workers through May, 1971. Since that date, he participated in the Subcommittee's study of the U.S. private pension plan system. Mr. Anderson was responsible for a significant aspect of the study—the review and summarization of data furnished by more than 1,200 selected private pension plans. He was assisted in this work by two GAO accountants and other clerical assistants * * *. In addition, he assisted in preparing for Subcommittee hearings, including interviewing potential witnesses and analyzing pertinent financial and accounting data. This work, which involved interviews with workers, as well as high corporate and union officials, was conducted in a manner which reflected credit to the Subcommittee.

Mr. Anderson handled these complex and difficult assignments most capably and gave generously of his time and effort to the study. His many years of professional accounting and investigative experience were of considerable value to the Subcommittee, as was his pleasant manner and spirit of cooperation with the staff.

From Representative George Mahon, chairman of the House Appropriations Committee, January 14, 1972:

Messrs. Warren F. Bedell and John A. Remke have concluded their work with the Surveys and Investigations Staff of this Committee, and I would like to express my appreciation for their services.

They proved to be very capable Staff associates, and made excellent contributions to the studies to which they were assigned.

A separate letter dated January 26 from Mr. Mahon stated:

Mr. Robert A. Davis has recently completed an assignment with the Surveys and Investigations Staff which included participation in several studies not only complex

but demanding in nature. His contributions to each of these studies were of material assistance and reflective of his vast experience and excellent qualifications as a representative of the General Accounting Office.

From Representative Wright Patman, chairman, House Committee on Banking and Currency, January 14, 1972:

On January 3, 1972, the House Banking and Currency Committee released its final report on *The Penn Central Failure and the Role of Financial Institutions*. As I have communicated with you in the past, this study was done with the invaluable assistance of Raymond Cohen, a Supervisory Auditor-Accountant assigned to the Committee by the General Accounting Office.

In the years that this Committee has obtained assistance on various projects from the General Accounting Office, it has never provided a more competent person than Mr. Cohen. I think it is fair to say that without his assistance this project would not have been the success that it turned out to be.

GAO Looks at the Reporting System of Government Securities Dealers

In May 1970, the then chairman of the Joint Economic Committee, Representative Wright Patman, asked the GAO to review the statistical and financial reporting system for dealers in Government securities. This system had been established by the Federal Reserve System in 1960 to provide information on the functioning of the market in Government securities.

The Government securities market is one of the means through which the Federal Reserve System controls the supply of money and the raising and lowering of interest rates. The Federal

Reserve System buys and sells these securities from certain banks and investment companies who are responsible for creating and maintaining a market for the public. In 1970, dealers reported total transactions of more than \$738 billion. To monitor and accumulate information on this market, the Federal Reserve asked the dealers to submit certain daily statistical data and annual financial reports on their activities.

The purpose of the GAO review was to determine whether the reporting system afforded the committee and the public an accurate picture of the operations and profits of the securities dealers as a group and whether good accounting practices were being followed in preparing the reports.

The GAO report (B-169905) was submitted to the committee on October 6, 1971. The full text of the report along with a statement by Mr. Patman appears in the *Congressional Record* for October 18, 1971.

The report concluded that the statistical information furnished by the dealers was reasonably reliable but that the financial data were not reliable because of inconsistent and inaccurate accounting. Numerous recommendations for improving the system were made.

Chairman Patman stated that the GAO report revealed that "the Federal Reserve System has allowed these dealers to report their operations in the Government securities market in an inadequate—in fact, in a chaotic—manner." He also noted that "The sloppy nature of the financial reporting has

rendered the data virtually meaningless for the Federal Government and the public." And he aimed a number of other observations at the system, including a suggestion that the dealers be taken out of the picture and a joint Treasury-Federal Reserve trading desk be established to deal directly with buyers of securities.

The congressional request assignment was handled almost completely by the New York Regional Office, which is headed by *Alfonso J. Strazullo*. He reports that the assignment was a new experience for that office for these reasons:

- GAO has no direct audit authority over the Federal Reserve System or over private banks and investment companies.
- The securities field was new to the audit staff and a great deal of effort was required to assimilate the facts related to market operations, trade practices, and securities accounting procedures.
- The records reviewed were confidential and both the Federal Reserve and the dealers were concerned with disclosure.
- The regional office had near-complete responsibility for the job, including the preparation of the report for the Comptroller General's signature. (Some planning and advisory assistance was provided by the Office of Policy and Special Studies—now the Division of Financial and General Management Studies.)

The review was performed by *Paul S. Trapani*, audit manager, *Samuel*

Pisano, James D. Van Blarcom, John M. Hornung, and Eric Krebs, under the overall direction of Herbert E. Larson, assistant regional manager.

Informing the Public About GAO

When you read in the newspapers that Government executives are only paying \$1.43 for a ten dollar lunch, that the new poultry inspection law is hatching malpractices, that a million dollar weapons contract is costing twice that amount for weapons that don't function, the investigation and reporting work has been done by the U.S. General Accounting Office. This Office variously referred to by the news media as Government Accounting, Comptroller General, Auditor General or Inspector General is the Office I am going to tell you about today.

Thus did Mrs. *Margaret L. Macfarlane*, who retired last year as chief of the GAO Legal Reference Services, begin her talk about GAO on January 17, 1972, before the Business and Professional Women's Club of Beaver Dam, Wis. Mrs. Macfarlane then provided her listeners with a brief review of the evolution of GAO and the kind of functions it performs.

The *Review* is glad to take note of this kind of activity on the part of former employees. Acquainting outside groups with the machinery of our complex governmental system is a most useful activity, whether by active or former employees. We especially welcome increased public knowledge and understanding of the role and operations of the GAO.

Bridges of Understanding

The manager of the Detroit Re-

gional Office, *Charles H. Moore*, submits the following commentary on his office's use of GAO's 50th anniversary lectures which were recorded on video tape.

Our video-taped 50th anniversary speeches have helped us in Detroit to build "bridges of understanding" with well-known local personalities. In recent weeks we have viewed and discussed two of the speeches with Henry Welch, Vice-President in Charge of the Financial Staff, General Motors Corporation, and George Pruette, Anchorman, Channel 4 News (local TV program).

Several of our staff members and Mr. Welch watched the speech by Dr. Alexander Trowbridge on "Building Business Understanding and Support of Governmental Programs." Afterward, Mr. Welch discussed some of General Motors' successes and failures with Government programs. Our staff then questioned Mr. Welch about various topics of current interest—auto safety standards, air pollution, international trade, and national priorities.

We invited Mr. Pruette to view the speech by Hugh Sidey on "Improving Public Understanding of Public Affairs." After answering some general questions, Mr. Pruette gave us some interesting insight into how a local television news program is put together. Particularly significant, we thought, were his comments on factual and objective reporting—a matter of vital importance to us. He also discussed ways we could effectively and properly cooperate with the local news media.

We are enthusiastic over the opportunity to talk with people we do not regularly deal with and we believe our discussions provided additional mutual understanding of the challenges facing Government, industry, and the news media.

Need for Eternal Vigilance

"Eternal vigilance * * * is the price of efficient government."

This neatly phrased principle was

the concluding comment in an article about a GAO report by Edward H. Dickson, published in *The Sacramento Bee* for January 13, 1972. The report discussed was entitled "Management of Selected Aspects of the Strategic and Critical Stockpile—Office of Emergency Preparedness and General Services Administration," B-125067, December 9, 1971.

The writer also observed from his reading of the report that "it is unwise to create a government operation and then having done so walk away with confidence that all will be right in the bureaucratic world forevermore."

Campaign To Improve Federal Regulation Writing

Senator Marlow W. Cook of Kentucky has launched his own campaign to make Federal regulations more readily understandable. As reported in the *Congressional Record* for December 17, 1971, Mr. Cook makes these observations:

I must go yet one step farther and say the blame for this confusion and misunderstanding rests squarely with the Government for its failure to communicate—its inability even to speak and write the English language in a way in which it is taught in the schools of the country.

This inability of the Government to communicate—to talk the English language so that it can be understood by the average high school or college graduate—is not merely evident in the laws that Congress writes.

* * * * *

We have—the country has—a whole new language that has been developed by the administrative or executive arm of the Government. This new language is really a hodge-

podge of separate languages with a hodgepodge of different boards and commissions and examiners to interpret it.

The new language is not only complex but it is contradictory. It employs words that defy understanding even by persons who run for their English language dictionaries. This language is so far removed from dictionary English that it contains its own word and phrase definitions, and these are known to vary widely within the language—this is why I said a moment ago that it is really a hodgepodge of separate languages.

* * * * *

My intention is not to find and bring along a literary genius, but to persuade the rule and regulation scribes and the bosses of those scribes to make some sense out of the regulations that affect the lives of all Americans.

Therefore, I am today starting an effort of my own to point out the weaknesses and the loopholes, the ridiculous definitions and interpretations, the vast amount of trivia and the broad basis for misunderstanding that exists in Federal rules and regulations.

* * * * *

I hope that my efforts will have some effect in establishing the English language and commonsense in the field of rulemaking to implement the laws of Congress.

New York State Audit System

The Department of Audit and Control of the State of New York has been in the forefront in developing audit techniques and expanding the scope of the governmental auditor's work. In his report of October 26, 1970, to the New York Legislature, Arthur Levitt, State Comptroller, succinctly stated the objectives of their audit system:

Our integrated pre-audit/post-audit program has three basic objectives: (1) a continuation of the traditional audit for financial accountability and legality; (2) an eval-

uation of performance efficiency from a managerial perspective; and (3) an evaluation of agency program accomplishments. Similarly, our accounting system has been improved to serve not only the traditional function of control, but also the needs of government managers at all levels.

The Navy Explains Internal Audit

Staff members who are well versed in GAO's statements and publications on internal auditing will recognize some very familiar wording in the Navy's response to a question on the subject during hearings on the Navy's 1972 budget. The following exchange took place between the chairman of the Senate Appropriations Committee, Allen J. Ellender of Louisiana, and Anthony Yannella of the Navy Comptroller's office.

Chairman Ellender. What is the relationship between the naval audit service and the General Accounting Office, aside from the fact that GAO reports directly to the Congress? Is the naval audit service ever audited by GAO?

Mr. Yannella. Internal audits conducted by the naval audit service provide a service to managers throughout the Department of the Navy. Audits render an independent and objective evaluation of the effectiveness and efficiency of management policies, systems, procedures, and controls. In its audits, the General Accounting Office reviews the entire control mechanism within an agency, including the various arrangements made by the management for internal audits and other forms of inspection, appraisal, and evaluation. If warranted by its evaluations, the General Accounting Office will rely on such internal audit work and make full use of it in conducting its examinations. The GAO is interested in the degree of agency management concern and interest in the work of the internal auditor and particularly in his

reported findings and recommendations. The actions taken by management officials on internal audit recommendations are reviewed by GAO auditors. Normally there is little duplication of the work of the internal auditor. The internal auditor performs his work as part of management's pattern of operation and control. The GAO review is part of the independent appraisal it makes for the Congress of the manner in which Federal agencies discharge their responsibilities and of the effectiveness for their control systems, including internal audit. The General Accounting Office has audited the naval audit service and has issued reports to the Congress appraising the effectiveness of internal audit. One of the conclusions reached by GAO was:

"That the naval audit service is to be commended for its actions to focus the attention of its professional staff, to the maximum extent practicable, upon reviews of management effectiveness and the adequacy of related controls."

(Senate Hearings Before the Committee on Appropriations, Department of Defense Appropriations, Fiscal Year 1972: Part 3, Department of the Navy, p. 587.)

Value of Visual Aids

An outstanding example of the value of visual aids in presenting and explaining complex operations is provided by the Civil Division's recent study of child care activities in the District of Columbia.

Because of the number of such programs and the uncoordinated way in which they evolved, the Civil Division staff developed a highly effective chart presentation. These charts used the overlay technique which enabled listeners to grasp the story of uncoordinated growth in short order and convinc-

ingly illustrated the need for better coordination and management.

The presentation was made to several groups, including the chairman of the House Committee on Education and Labor, Carl D. Perkins, and members of his staff, on November 3, 1971. This presentation resulted in a request for a written report on the subject. The report, which was submitted on January 24, 1972 (B-174895), includes the several charts around which the oral presentation had been made.

The presentation was also made to officials of the District of Columbia and others. Edward Zigler, Director of the Office of Child Development, Department of Health, Education, and Welfare, subsequently sent the following letter to the Comptroller General.

The recent study of federally funded child care activities in the District of Columbia which was conducted by your office is an excellent example of the application of management analysis techniques to the use of program funds.

Mr. John Cronin, who presented a summary of the report to me and members of my staff, has done a remarkable job in graphically representing the chaos of multiple, uncoordinated funding resources, as well as identifying those areas in which corrective action is called for to assure effective use of Federal funds.

The findings of this study are most instructive to those of us having particular concern with the maximum effectiveness in use of Federal dollars to provide necessary services for children. Your office, and those who prepared the study, are to be commended for this fine job.

This experience suggests that GAO staffs should make greater use of graphic aids, not only in formal reports but as a basis for orally present-

ing complicated findings to congressional and agency officials.

GAO Reviews of Meat and Poultry Inspection Activities

In recent years, GAO has completed three major reviews of the meat and poultry inspection activities of the Department of Agriculture. These were reported to the Congress as follows:

- Enforcement of Sanitary, Facility, and Moisture Requirements at Federally Inspected Poultry Plants, Consumer and Marketing Service, Department of Agriculture, B-163450, Sept. 10, 1969.
- Weak Enforcement of Federal Sanitation Standards at Meat Plants by the Consumer and Marketing Service, Department of Agriculture, B-163450, June 24, 1970.
- Consumer and Marketing Service's Enforcement of Federal Sanitation Standards at Poultry Plants Continues To Be Weak, Department of Agriculture, B-163450, Nov. 16, 1971.

These reports brought to public light adverse findings on the enforcement of Federal sanitation standards in plants visited by GAO in company with departmental inspectors.

What is sometimes overlooked is the fact that GAO was reviewing Federal meat inspection activities as far back as 1959. The work that culminated in GAO's first report in this field also resulted in numerous findings about unsanitary conditions. A report on this work was sent to the Congress in June

1959 (B-133192) with the title "Review of Activities of the Meat Inspection Division," Department of Agriculture. This review was performed under the direction of *Otis D. McDowell*, assistant director, Civil Division.

This earlier work was not overlooked by Robert Vaughn of Ralph Nader's Public Interest Research Group who specifically referred to it in testimony in August 1971 before the Subcommittee on Public Health and Environment of the House Committee on Interstate and Foreign Commerce.

New Institute for Tax Administration

The School of Public Administration of the University of Southern California is establishing a new and separate program for training, education, and research in tax administration. This program will be carried out by a new Institute for Tax Administration and is said to be "the first center of learning to bring together the various disciplines that comprise this art in an effort to help states, counties and municipalities improve and modernize their administration." The Institute is designed to meet a need for better training in a neglected area. Major problems that have emerged because of the lack of administrative training in taxation are said to be:

1. Evasion—the tax burden is increasingly distributed on the basis of ability and willingness to evade rather than on the equity prescribed by law. Changes in tax legislation, therefore, tend to punish the honest.

2. The inability of State, county, or local governments to meet their obligations.
3. Tax policies or laws that are desirable, for all practical purposes, are limited to those the administration can effectively carry out rather than those that are based upon economic policy or public need.

Further information about the Institute may be obtained from its director, Norman D. Nowak, 311 South Spring Street, Los Angeles, Calif. 90013.



Henry R. Domers

Henry R. Domers, who left GAO in January 1970, died of a heart attack on January 14, 1972, at the age of 66 years. Up to the time of his retirement, he had been serving as assistant for administrative management in the Office of the Director, International Division.

Mr. Domers joined the GAO in 1935 and served effectively in a variety of audit assignments, both in Washington and in the field. He was the first director of the European Branch where he served from 1952 to 1954. From Octo-

ber 1954 to April 1959, he was the executive director of the Federal Power Commission. He rejoined the staff of the GAO in September 1966.

Alfred Mueller

Alfred Mueller, supervisory auditor, International Division, died of a heart attack on January 17, 1972. Mr. Mueller was born in Wiesbaden, Germany, in 1930. He served in the U.S. Air Force from 1954 to 1958 and

graduated from the University of Scranton in 1962 with a B.S. degree. He joined the Civil Division of GAO in August 1962.

Mr. Mueller served in the European Branch, ID, from November 1965 to May 1970, and in ID, Washington, from that time until his death. He received the Meritorious Service Award in 1971.

He leaves many friends, not only in the Washington area but also in other parts of the world where he had worked.

Part of Good Government

. . . the GAO was created to assist the Congress in providing legislative control over the receipts, disbursement, and application of public funds. I frankly can think of no more important function of a Government agency. The type of professional and independent audit review that GAO provides the Congress, and the public, is essential to the conduct of good government.

*Representative Edward J. Derwinski
of Illinois
Congressional Record, August 2, 1971.*

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HEARINGS *and* LEGISLATION



BY JUDITH HATTER

Assistant Chief, Legislative Digest Section, Office of the General Counsel

Intergovernmental Fiscal Coordination Act of 1971

An important revenue sharing measure was introduced by Wilbur Mills of Arkansas, chairman of the House Ways and Means Committee. The Intergovernmental Fiscal Coordination Act of 1971, 92d, H.R. 11950, establishes in the Treasury of the United States a "Local Government High-Priority Expenditure Trust Fund." In order to qualify for payment, a local government must provide information to the Comptroller General containing certain assurances relative to expenditure plans. If the Comptroller General determines that a local government has failed to comply with certain provisions or regulations, further payment is to be withheld until the Comptroller General is satisfied that corrective action has been taken. The Comptroller General is to provide for such accounting and auditing procedures and whatever evaluation and review are necessary to insure that the expenditures of funds comply with the requirements of the law.

Export Expansion Activities

On January 25, 1972, the Comptroller General testified before the Subcommittee on Foreign Commerce and Tourism of the Senate Commerce Committee at hearings on 92d, S. 2754, Export Expansion Act of 1971. Mr. Staats summarized GAO audit experience regarding efforts to strengthen trade and dollar positions and commented specifically on provisions of the legislation. Attached to the formal statement was a representative listing of GAO reports issued since July 1, 1967, on trade-related matters as well as a listing of other reviews in process. (Other participants: Messrs. Hylander, Milgate, Kurihara, Terri, and Fitzgerald.)

Impoundment of Appropriated Funds

Senator Hubert H. Humphrey of Minnesota introduced 92d, S. 2604, the Federal Impoundment Information Act, which would require the President of the United States to notify the

Congress and the Comptroller General when appropriated funds are partially or completely impounded. This language was subsequently adopted by the Senate as an amendment introduced by Senator Humphrey to the Revenue Act of 1971. The House did not consider the amendment on its merits because of questions raised as to its germaneness under the House rules, and during the conference the Senate receded from its amendment.

On January 26, 1972, Representative William R. Anderson of Tennessee introduced a measure, 92d, H.R. 12641, to require that Congress be notified by the President when he impounds appropriated funds. In his remarks Mr. Anderson indicated that the bill is based on S. 2581, introduced by Senator Sam Ervin of North Carolina on September 27, 1971, except that the definition of impoundment has been changed to coincide with the definition used by the "Glossary of Terms Relating to the Budget and Fiscal Provisions of the Legislative Reorganization Act of 1970" issued by the General Accounting Office.

Currency Exchange Rates

The House Committee on Government Operations issued a report on December 16, 1971, entitled "Vietnam and the Hidden U.S. Subsidy (Inequitable Currency Exchange Rates)," H. Rept. 92-760. The hidden subsidy in exchange rates, based on figures computed by the General Accounting Office, totaled about half a billion dollars for the past 3 years. Testimony by

Charles D. Hylander, deputy director, International Division, pointed out that the amount represented additional aid to Vietnam not subjected to the normal authorization and appropriation processes for other forms of economic assistance.

To remedy the situation the report recommended that the President of the United States negotiate with the Government of Vietnam a unified rate of exchange encompassing the official and accommodation rates to be set realistically as soon as possible at or near the free market level, and that the Congress, in passing upon the U.S. economic aid program for Vietnam, take into consideration the projected increases in collection of customs duties by the Vietnamese Government and/or the elimination of windfall profits to importers.

Single-Family Mortgage Insurance Programs

Baltas E. Birkle, assistant director, Civil Division, appeared on December 2, 1971, before the Legal and Monetary Affairs Subcommittee of the House Committee on Government Operations to discuss administration of single-family mortgage insurance programs by the Detroit Area Office of the Department of Housing and Urban Development.

Mr. Birkle outlined mortgage insurance programs being dealt with during the GAO review which is still in process. With respect to the program under section 223(e) of the National Housing Act, which provides for insuring

mortgages on property located in older declining urban areas, it was pointed out that failure to properly identify houses for the Special Risk Insurance Fund precluded disclosure by HUD of the true cost of the program. (Other participants: Messrs. *Shanks* and *Thompson*.)

Military Construction Management

While conferees struck a general provision from the Military Construction Appropriation Act, 1972, concerning reduction of construction costs in the Department of Defense, they agreed with the intent of this provision and requested the General Accounting Office to make a complete and unbiased investigation of the efficiency of construction management and the equitableness of charges by construction agencies for construction supervision, inspection, and overhead, as specified in Department of Defense Directive 7040.2. In making the study GAO is to investigate the rates charged for similar work in private industry and compare them with those charged by Department of Defense construction agencies and report to the conferees within 10 months. (H. Rept. No. 92-664)

Health Facilities Construction Costs

The Comprehensive Health Manpower Training Act of 1971 (Public Law 92-157, Nov. 18, 1971, 85 Stat. 431) provides for a study by the

Comptroller General of health facilities construction costs. The study is to consider the feasibility of reducing the cost of constructing federally-assisted health facilities with respect to innovative techniques, new material, and the possible waiver of unnecessarily costly Federal standards. A report is to be submitted to Congress within 1 year after the enactment date.

Davis-Bacon Act Repeal

Referring to findings by the General Accounting Office in the report "Need for Improved Administration of the Davis-Bacon Act Noted Over a Decade of GAO Reviews, Department of Labor," B-146842, July 14, 1971, Senator John Tower of Texas introduced 92d, S. 3036, to repeal the Davis-Bacon Act. In discussing his reasons for introducing the legislation, Senator Tower stated:

* * * the Davis-Bacon Act was an emergency measure passed during a great depression. It carried the humanitarian purpose of preventing wages from falling precipitously at that time. The situation in today's construction industry is totally different. * * *

It seems obvious that such an industry does not need the assistance of an inflationary Davis-Bacon Act. The fact that the law's impact has been inflationary seems beyond dispute. * * *¹

Previously, on November 11, 1971, Representative Bill Archer of Texas, on behalf of himself and others, introduced an identical bill, 92d, H.R. 11717, also citing the General Accounting Office report.

¹ *Congressional Record*, Vol. 118, Jan. 19, 1972, p. S 19.

Drug Treatment Programs

Representative Louis Frey, Jr., of Florida, introduced 92d, H.R. 12843, to amend the Community Mental Health Centers Act to reorganize certain grant programs in order to "induce States to establish drug treatment programs for addicts who reside in the various States * * *."² In his remarks on introduction of the measure Mr. Frey referred to testimony by *Dean Crowther*, associate director, Civil Division, concerning GAO's study of Federal treatment programs.

Intergovernmental Cooperation Act of 1972

Senator Edmund Muskie of Maine, for himself and others, introduced the Intergovernmental Cooperation Act of 1972, 92d, S. 3140. Section 703 of the bill authorizes the Office of Management and Budget, with the cooperation of the Comptroller General, to promulgate principles and standards of auditing for the guidance of Federal, State, and local agencies, and independent public accountants, in their audits of Federal assistance programs. The Comptroller General's audits of Federal assistance programs are to include

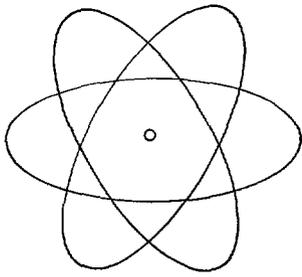
² *Congressional Record*, Vol. 118, Feb. 2, 1972, p. H 665.

reviews of the extent of utilization by Federal agencies of audits performed by State and local agencies and of the extent of implementation of audit principles and standards. The Comptroller General is also to make recommendations to Federal agencies to assist them in implementing the provisions as they relate to Federal assistance programs.

General Accounting Office Supergrades

Public Law 92-190, approved by the President on December 15, 1971, authorizes compensation for five General Accounting Office positions at rates not to exceed the rate for Executive Schedule level IV. The Comptroller General may fix compensation for the five positions from time to time when he considers it necessary because of changes in the organization, management responsibilities, or workload of the Office.

Mr. *Staats* pointed to the enactment of the Legislative Reorganization Act of 1970 in describing the necessity for the new positions because that act provides for greater use of the GAO as an arm of the Congress in examining and analyzing the management of existing Federal programs and increasing GAO's staff assistance to congressional committees.



AUTOMATIC **D**ATA **P**ROCESSING

Congressional Needs for Budgetary and Fiscal Information

A GAO task force has completed a comprehensive interview survey of 249 individuals representing 42 congressional committees and 68 Members of Congress to explore in depth congressional needs for budgetary and fiscal information. The results have been analyzed and are described in a report on "Budgetary and Fiscal Information Needs of the Congress," B-115398, dated February 17, 1972.

The Legislative Reorganization Act of 1970 requires the Director, Office of Management and Budget, and the Secretary of the Treasury to develop standard classifications and a standardized budgetary and fiscal data system to serve the needs of all branches of the Government. The Comptroller General is to collaborate in this work. GAO's responsibility is to identify congressional needs and see that they are adequately considered in developing the expanded information system.

The GAO task force was led by *Kenneth W. Hunter*, assistant director, Financial and General Management Studies Division, and included the following staff members from that divi-

sion and the Washington Regional Office:

Washington Regional Office:

Geraldine F. Jasper

Edward A. Waytel

John B. Ippolito

Donald L. Myers

Financial and General Management
Studies Division:

Peter A. Smith

James K. Kardokus

James G. Williams

Leslie D. Adams

Generally Accepted Principles and Procedures for Information Systems

The ADP staff of the Financial and General Management Studies Division has undertaken a long-term project aimed at (1) developing generally accepted principles and procedures for the planning, development, and operation of information systems and (2) creating a body of knowledge supporting these principles and procedures.

On January 18, 1972, the Comptroller General asked the National Academy of Sciences to assist in this long-term effort, and they have directed their Computer Science and Engineer-

ing Board to initiate this cooperative effort.

It is envisaged that the project will be undertaken in stages. The first stage, the development of a plan for the longer term effort, will be undertaken by a special Planning Group of the Board, from February to July 31, 1972. The Planning Group will be made up of Board members and other specialists and generalists to assure the necessary range and depth of expertise. It is anticipated that selected field and Washington GAO people will contribute, as appropriate, their experience as professional accountants and system specialists to the immediate and longer term work of the Board. Follow-on activities will depend upon the outcome of this planning effort.

The Planning Group is to take the following steps: (1) complete a general planning paper by the end of February 1972, (2) hold a workshop in March or April 1972 to explore the needs, priorities, sources of knowledge, and contributions various individuals and organizations could provide, and (3) hold a second workshop in May or June 1972 to evaluate existing materials; assess related, on-going research; identify relevant expertise and experience in individuals and organizations; and estimate prospects for making use of these materials, research activities, expertise, and experience.

The product of this effort is to be a long-term plan to be completed by July 31, 1972. The plan is to include the following elements: a definition of the general problem to be attacked in the longer term effort; a general evaluation of the various avenues that could

be followed; a list of specific, though perhaps broad, tasks to be considered, and suggested priorities and procedures; an identification of significant milestones that may be encountered along the way; an indication of pertinent and useful individual and organizational resources available; a rough estimate of the time that may be required to carry out the plan as developed; and a broad appraisal of the prospects for achieving the desired goals.

In agreeing to participate in this project, the Board stated that it believes that the effective operation and use of computer systems is a nationally important problem and that the outcome of the long-term program of the General Accounting Office will contribute directly to the improved utilization of computer systems throughout the Government and the Nation at large. The Board also believes that there could be an equally significant, though perhaps less direct, contribution to the overall efficiency and effectiveness of the general management activities performed at various levels of government in the United States. At the same time, the outcome of the long-term effort could contribute significantly to the development of the general computer science and engineering field.

The GAO project director is *Kenneth W. Hunter*, assistant director, Financial and General Management Studies Division.

Retrieval Programs

Are generalized retrieval programs available at your audit site? A gener-

alized retrieval program normally will (1) extract data, (2) produce various levels of control totals, (3) permit selection of records meeting specified criteria, (4) permit printing of output in any desired order, and (5) select samples.

During a recent ADP survey at the Corps of Engineers, Little Rock, Ark., representatives of the Dallas Regional Office were advised that a generalized retrieval program, GET 90, is available for the General Electric 225 computer system. The Dallas office is making arrangements to obtain a copy of this program which enables a user to perform the above functions on a GE 225.

During another ADP survey at Reese Air Force Base, Lubbock, Tex., the Dallas office found that the Air Force has plans for a computerized retrieval system for the Burroughs 3500 and the IBM 360 systems. The Air Force also has a retrieval system entitled FASTRAND SCAN for the UNIVAC 1050 system. The retrieval program for the Burroughs 3500 system is called the Air Force Audit/Management System (AFA/MS) and should be of interest to GAO auditors since many Air Force installations have or will have the Burroughs 3500 computer.

These retrieval programs increase GAO's ability to use the computer for audit purposes.

Improved Auditape System for Honeywell 200

A new version of the Auditape System for Honeywell Series 200 tape systems was made available to GAO dur-

ing January 1972. The salient features are listed below.

1. A Sort Routine has been added.
2. The Edit Routine can utilize from 12K to 32K of memory (20K was the upper limit previously). The maximum input block sizes that now can be processed are as follows:
 Characters of memory:
 12K 16K 20K 24K or larger
 Maximum block size:
 2,048 5,120 8,192 9,999
3. The Update and Usage Report features have been eliminated.
4. Honeywell's Tape Handling Routine C has been added—program code name AAFTOR. The routine can be used for a variety of purposes such as listing the contents of a tape, copying a tape file, etc.
5. The Print/Punch Routine will now write a print image tape file when an on-line printer is not available. The file can then be taken off-line and listed with a program that has been added—program code name TAPPRT.
6. The new version of the Auditape System for Honeywell Series 200 tape systems utilizes Honeywell's Mod-1 Tape Resident operating system (BRT version).

These improvements add considerably to the usefulness and versatility of the Auditape System. Specific questions on these improvements or on use of ADP techniques in general should be directed to members of the ADP Group, Division of Financial and General Management Studies.

QUESTIONS AVAILABLE

A. T. Samuelson



A. T. Samuelson was appointed Assistant Comptroller General, effective April 3, 1972. In this position he is responsible for overseeing and assisting three newly created divisions—Manpower and Welfare, Resources and Economic Development, and General Government.

Mr. Samuelson joined the staff of the former Corporation Audits Division in September 1946 and was appointed director of the Civil Division in October 1956. He received the GAO Distinguished Service Award in 1957 and the Comptroller General's Award in 1971.

Mr. Samuelson is a member of a number of professional organizations including the American Institute of CPAs, the Illinois Society of CPAs, the District of Columbia Institute of CPAs, the National Association of Accountants, the Federal Government Accountants Association, the American Accounting Association, and the American Society of Public Administration. He has been active with the National Association of Accountants at both local and national levels, having been president of the Washington Chapter (1963-64), the national director (1967-69), and currently is an international vice president. He is serving for the second year as Chairman, Governmental Accounting Committee, of the District of Columbia Institute of CPAs.

Mr. Samuelson is a CPA (Illinois) and for 9 years was associated with the Chicago office of the public accounting firm of Price Waterhouse & Co. He served with the Navy in World War II, attaining the rank of commander. He is a graduate of Walton School of Commerce and has attended Loyola University and Northwestern University in Chicago.

Case Studies of Auditing in a Computer-Based Systems Environment

A new GAO publication of almost 300 pages under this heading is a valuable compilation of information and experience for reference use by those interested in utilizing computer techniques in auditing or faced with the need to evaluate a computer-based system. Although dated June 1971, this volume of case studies, which was assembled by the ADP Group of the Financial and General Management Studies Division, did not become available for distribution until January 1972 because of printing difficulties.

The Comptroller General's foreword explains that the studies involved particular attention to:

- Effectiveness of internal auditing of computer-based systems.
- Adequacy of system documentation.
- Use of computer techniques in auditing computer-based systems.

Also included in the compilation are GAO review guides for (1) ADP aspects of Federal agency accounting systems and (2) evaluating internal controls in ADP systems.

This compilation was prepared under the direction of *Edward J. Mahoney*, deputy director, and *Joseph L. Boyd*, assistant director, of the Financial and General Management Studies Division. Representatives of the Civil Division and of the Philadelphia, Chicago, Kansas City, Dallas, and San Francisco Regional Offices participated in the case studies and the preparation of other information included.



Thomas D. Morris

Thomas D. Morris was appointed Assistant Comptroller General, effective April 3, 1972. In this position he is responsible for overseeing and assisting four operating divisions concerned with reviews of Federal management functions—Financial and General Management Studies, Logistics and Communications, Procurement and Systems Acquisition, and Personnel and Compensation.

Mr. Morris joined the General Accounting Office in October 1970 as a Special Assistant to the Comptroller General. On February 17, 1971, he was designated Assistant to the Comptroller General for Management Services.

Mr. Morris has had extensive experience in Government and private industry, most recently serving as corporate vice president of Dart Industries in Los Angeles. His governmental experience has been primarily in the Department of Defense, the Bureau of the Budget, and the Tennessee Valley Authority.

During World War II, he served in the Navy from 1942 to 1945 as a member of the Navy Management Engineering Staff. Following World War II, Mr. Morris joined the consulting firm of Cresap, McCormick & Paget where he served for 5 years as a partner and participated in studies by both Hoover Commissions.

In 1956–57 he served in the Office of the Secretary of Defense in several capacities, including the position of Deputy Assistant Secretary for Supply and Logistics.

In 1958–59 Mr. Morris was director of management planning and assistant to the president of the Champion Paper & Fibre Co., following which he was appointed Assistant Director for Management and Organization in the Bureau of the Budget. Beginning in 1961, he served for more than 5 years as Assistant Secretary of Defense for Installations and Logistics and for more than 2 years as Assistant Secretary of Defense for Manpower.

Ellsworth H. Morse, Jr.



Ellsworth H. Morse, Jr., was designated Assistant Comptroller General, effective April 3, 1972. In this capacity he will be responsible for the policy and long-range planning functions of GAO, including general supervision of the Office of Policy, the Office of Program Planning, and the Office of Internal Review.

Mr. Morse has been in the GAO since July 1946 when he joined the staff of the former Corporation Audits Division. In 1956 he became director of the Division of Audits and later in that same year he became director of the newly formed Accounting and Auditing Policy Staff, which was redesignated in 1966 as the Office of Policy and Special Studies. He received the Comptroller General's Award in 1967 and the National Civil Service League Career Service Award in 1968.

Mr. Morse is a member of the American Institute of CPAs, the District of Columbia Institute of CPAs, the American Accounting Association, and the Federal Government Accountants Association of which he is the immediate past president. He is also a member of the Committee on Professional Recognition and Regulation of the American Institute of CPAs and the Advisory Council for the Institute of Professional Accounting of the Graduate School of Business, University of Chicago.

Mr. Morse holds a B.A. degree from Oberlin College, an M.B.A. degree from the University of Michigan, and is a CPA (Michigan). He was associated with the public accounting firm of Arthur Andersen & Co. from 1937 to 1942. He served in the Naval Reserve from 1942 to 1946 and was discharged as a lieutenant commander.



Gregory J. Ahart

Gregory J. Ahart was designated director of the newly created Manpower and Welfare Division, effective April 3, 1972.

Mr. Ahart served in the Army from 1952 to 1954. He joined the General Accounting Office in 1957 and has served as deputy director of the Civil Division for the past 5 years.

In 1957 Mr. Ahart graduated *summa cum laude* from Creighton University with a B.S.B.A. degree and in 1961 obtained an LL.B. degree from the Georgetown University Law Center. He became a CPA (Nebraska) in 1957 and a member of the Virginia Bar in 1961. In 1963 he attended the Program for Management Development at the Harvard University Graduate School of Business Administration. He is a member of the American Institute of CPAs.

Mr. Ahart has received three GAO Meritorious Service Awards and the GAO Career Development Award. In 1969 he received the Arthur S. Flemming Award as one of the 10 outstanding young men in the Federal service.

William N. Conrardy



William N. Conrardy was designated director, Office of Program Planning, effective April 3, 1972. In this position he has the responsibility for developing long-range objectives and direction-of-effort planning for the General Accounting Office.

Mr. Conrardy served with the Navy Air Corps during World War II. He received a Bachelor of Business Administration degree in accounting from the University of Wisconsin in 1949 and completed the Advanced Executive Development Program at Stanford University Graduate School of Business in 1961. He joined the General Accounting Office in 1949 and worked out of Washington, D.C., with the Corporation Audits Division and the Division of Audits. In 1952 he transferred to the field and served in the St. Paul, Minn., and Denver, Colo., Regional Offices and as manager of the Salt Lake City Regional Office. He also served for 3 years with the European Branch prior to his appointment in 1958 as manager of the Seattle Regional Office.

Mr. Conrardy is a CPA in Wisconsin, Utah, and Washington. He is a member of the American Institute of CPAs, the Washington State Society of CPAs, the American Accounting Association, the American Research Association, the American Society for Public Administration, and the Federal Government Accountants Association. He received the GAO Meritorious Service Award in 1958 and the Career Development Award in 1968.



Henry Eschwege

Henry Eschwege was designated director of the newly created Resources and Economic Development Division, effective April 3, 1972. In this position, he will direct GAO's activities in the Departments of Agriculture, Interior, Transportation, and Housing and Urban Development, as well as in such agencies as the Environmental Protection Agency and the Atomic Energy Commission.

Mr. Eschwege joined the General Accounting Office in 1956 after serving for 7 years on the staff of a public accounting firm in New York City. He received a Bachelor of Science degree in accounting, *magna cum laude*, from New York University in 1949 and completed the Program for Management Development, Harvard Business School, in 1962. Mr. Eschwege is a CPA (New York) and a member of the New York State Society of CPAs and the National Association of Accountants. He served in the Army during World War II.

Since coming to GAO, Mr. Eschwege has served in numerous supervisory positions in the Civil Division. Of late, he was the associate director in charge of reviews of labor, education, and antipoverty programs.

Mr. Eschwege received the GAO Meritorious Service Award in 1965 and 1967 and the GAO Distinguished Service Award in 1968.

J. Kenneth Fasick

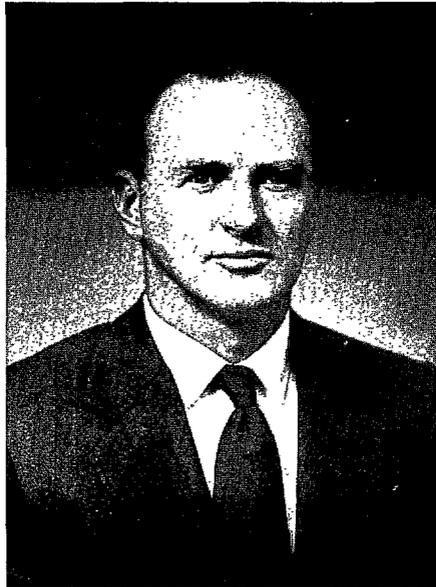


J. Kenneth Fasick was designated director of the newly created Logistics and Communications Division, effective April 3, 1972.

Mr. Fasick joined the General Accounting Office in January 1954. Prior to joining the Office, he had 5 years of public accounting experience. During the period 1955 through 1957, Mr. Fasick served in the European Branch. Since 1958 he has served in various positions with the Defense Division.

He is a certified public accountant in the District of Columbia and served in the Army from 1942 through 1945. Mr. Fasick received the GAO Meritorious Service Award in 1960 and the GAO Distinguished Service Award in 1968.

Mr. Fasick graduated from the University of Maryland with a B.S. degree in business administration and completed the Advanced Management Program of the Graduate School of Business Administration, Harvard University, in 1961.



Richard W. Gutmann

Richard W. Gutmann has been designated director of the newly created Procurement and Systems Acquisition Division, effective April 3, 1972.

Mr. Gutmann is a certified public accountant and practiced public accounting prior to joining the General Accounting Office in 1954.

During Mr. Gutmann's first 5 years with the General Accounting Office, he worked on the audits of Defense contracts, assisting in the development of the audit program for pricing reviews and providing technical and policy guidance for the execution of those reviews by the field staffs. His other experience in the General Accounting Office included the responsibility for all GAO activities in the Department of the Army. Later, as Director of the European Branch, he had responsibility for executing work in Europe, Africa, the Middle East, Pakistan, and India.

Since 1968, Mr. Gutmann has been deputy director of the Defense Division. In this capacity, he assisted in the overall direction of the accounting and auditing work conducted by the General Accounting Office in the Department of Defense, including the Departments of the Army, the Navy, and the Air Force and their contractors. Effective January 10, 1972, Mr. Gutmann was named acting director of the Defense Division.

Mr. Gutmann received the Meritorious Service Award in 1960 and the Career Development Award in 1970.

Victor L. Lowe



Victor L. Lowe was designated director of the newly created General Government Division, effective April 3, 1972.

Mr. Lowe joined the General Accounting Office in 1949 following his graduation from the University of Georgia. He has served in positions of increasing responsibility with the Corporation Audits Division, the Division of Audits, the International Division, and the Civil Division.

Mr. Lowe completed the Program for Management Development of the Harvard University Graduate School of Business Administration in 1960 and the Residential Program in Executive Education at the Federal Executive Institute in 1970. He served with the Navy in 1945 and 1946.

Mr. Lowe is a certified public accountant (Georgia) and a member of the American Institute of CPAs and the Federal Government Accountants Association. He received the GAO Distinguished Service Award in 1971.





Lloyd G. Smith

Lloyd G. Smith was designated director of the Office of Internal Review, effective April 3, 1972.

Mr. Smith graduated with honors from the University of California at Los Angeles in 1939 with a Bachelor of Science degree in business administration. From 1941 to 1945 he served in the Navy as a flight instructor and as a transport pilot. Before joining the General Accounting Office in 1953, Mr. Smith served as a staff member of a public accounting firm in Beverly Hills, Calif., and as controller of a manufacturing company.

With the General Accounting Office, Mr. Smith has served as an audit manager in the Los Angeles Regional Office; as manager of the Frankfurt, Germany, Office; as director of the European Branch; as an assistant and an associate director in the Civil Division; and as deputy director of the Office of Policy and Program Planning. In 1963 he completed the Advanced Management Program at the Harvard University Graduate School of Business Administration.

Mr. Smith is a CPA (California) and a member of the American Institute of CPAs and the Federal Government Accountants Association. He received the Meritorious Service Award in 1959.

Thomas E. Sullivan



Thomas E. Sullivan was designated as the director of the newly created Transportation and Claims Division, effective April 3, 1972. Prior to this designation, Mr. Sullivan was director of the Transportation Division. He joined the staff of the General Accounting Office in 1951 and has served in various audit positions in the civil and defense areas of Government expenditures.

Mr. Sullivan was an assistant director in the Defense Accounting and Auditing Division before transferring to the former Transportation Division. During the period 1954-56, he served as assistant director of the European Branch. At that time he was also the U.S. Delegate to the International Board of Auditors for Infrastructure of NATO.

Mr. Sullivan is a graduate of the University of Alabama and attended the Advanced Management Program of the Harvard University Graduate School of Business Administration in 1963. He is a certified public accountant (Pennsylvania) and is a member of the Pennsylvania Institute of CPAs and the Harvard Business School Association.



Allen R. Voss

Allen R. Voss was designated director of the Office of Policy, effective April 3, 1972. In this position, Mr. Voss is responsible for policy formulation, guidance, and review for all GAO functions.

Mr. Voss served in the Air Force from 1948 to 1952. He graduated with high honors from the University of Florida in 1956, with a Bachelor of Science degree in business administration. Before joining the General Accounting Office in 1958, Mr. Voss served as a staff member of a public accounting firm and as a cost accountant with a manufacturing company.

Mr. Voss has served as an assistant and associate director in the Civil Division and as an associate and deputy director in the Office of Policy and Program Planning. In 1966 he completed the Advanced Management Program at the Harvard University Graduate School of Business Administration.

Mr. Voss is a CPA (Florida) and a member of the American Institute of CPAs. He received Meritorious Service Awards in 1961 and 1968.

Harry C. Kensky



Harry C. Kensky was designated associate director of the Division of Financial and General Management Studies, effective April 3, 1972. He will be responsible for directing reviews of Federal agency accounting systems in operation.

Mr. Kensky has been in the GAO since January 1951 when he joined the staff of the former Corporation Audits Division. In 1952 he transferred to the Philadelphia Regional Office and became assistant regional manager in 1960. In 1967 he was designated director, Program Planning Staff, Office of the Comptroller General, and in July 1971 he became an associate director of the Office of Policy and Program Planning when that office was formed.

Mr. Kensky holds a B.S. degree in commerce from New York State University, and M.B.A. and Ed.D. (Doctor of Education) degrees from Temple University. He was associated with a public accounting firm in Philadelphia from 1947 to 1949. He served in the U.S. Naval Reserve from 1943 to 1946 as a communications officer and was discharged as a lieutenant.

Mr. Kensky is a CPA (Pennsylvania) and a member of the American Institute of CPAs, the Pennsylvania Institute of CPAs, and the Federal Government Accountants Association of which he is a past president of the Philadelphia Chapter. In 1971 he served as cochairman of the 20th National FGAA Symposium. He is an honorary member of Beta Alpha Psi and a member of Pi Gamma Mu and Delta Pi Epsilon. He received the GAO Career Development Award in 1970 and Meritorious Service Awards in 1959 and 1960.



Burdell O. Buerger

Burdell O. Buerger was designated as assistant regional manager of the Seattle Regional Office, effective January 10, 1972.

Since joining the General Accounting Office in 1952, Mr. Buerger has served in the Civil Division, the Denver Regional Office, and the International Division in Frankfurt, Germany. In recent years, Mr. Buerger has been responsible for reviews conducted by the Denver Regional Office of various programs administered by the Department of the Interior.

From 1940 to 1946, Mr. Buerger served in the Marine Corps. In 1951 he received a Bachelor of Science degree in business administration, with a major in accounting, from the University of Missouri. He is a CPA (Colorado) and a member of the American Institute of CPAs and the Colorado Society of CPAs.

David A. Hanna



David A. Hanna was designated assistant regional manager of the Chicago Regional Office, effective January 10, 1972.

Mr. Hanna served in the Air Force from 1952 to 1956. He graduated with honors from Armstrong College in 1959 with a B.B.A. degree in accounting.

Mr. Hanna joined the General Accounting Office in San Francisco in January 1960, and later that year transferred to the Chicago Regional Office. He is a certified public accountant (Illinois) and a member of the American Institute of CPAs.

PROFESSIONAL ACTIVITIES

Office of the Comptroller General

The Comptroller General, *Elmer B. Staats*, addressed the following groups:

The Brookings Institution, Washington, D.C., roundtable for professional staff, on "Role of the GAO in Assessing Management and Program Effectiveness," November 30.

The Washington, D.C., Rotary Club, on "GAO and the Comptroller General," December 1.

The National War College, Ft. McNair, Washington, D.C., on "The General Accounting Office in Action (Relations Between GAO and the Department of Defense)," December 17.

The National Institute of Public Affairs Conference on Federal Action and the People of Our Cities, Dallas, Tex., on the purposes of the conference and the relationship of GAO's work thereto, February 3.

Students of the Lyndon B. Johnson School of Public Affairs, at the University of Texas at Austin, on "The Role of the GAO in Evaluation of Federal Programs," February 4.

The Washington Chapter of the Federal Government Accountants Association, on "The Joint Financial Management Improvement Program—Potential for the 1970's," February 10.

Mr. Staats' address on "Issues Facing Financial Managers in the Seventies," delivered before the Financial Management Roundtable in Washington, D.C., March 11, was printed in the September 1971 issue of *The Federal Accountant*.

Mr. Staats' paper on "Management or Operational Auditing—An Extension of the Scope of the Work of Supreme Audit Institutions" which he presented at the 7th International Congress of Supreme Audit Institutions in September 1971 in Montreal, Canada, was included in a special edition of *Control Fiscal*, published by the Comptroller General of Venezuela. This issue was devoted to the papers and proceedings of the 7th International Congress. Mr. Staats' paper was also printed in the Winter 1972 issue of *The GAO Review*.

Mr. Staats has an article entitled "Role of the General Accounting Office in Auditing Federal Education Programs" in the January 1972 (Vol. 1, No. 1) issue of the *Journal of Law & Education*. This is a new magazine published by Jefferson Law Book Company of Silver Spring, Md. The editor is Carl F. Stover.

Another article by Mr. Staats was printed in the January–March 1972 issue of the *Civil Service Journal*. That article was entitled "GAO—50 Years of Progress."

The Deputy Comptroller General, *Robert F. Keller*, spoke before the Seminar on Government Contracts, Yale University Law School, New Haven, Conn., December 10.

Office of the General Counsel

Paul G. Dembling, general counsel:

Spoke on "The Role of the General Accounting Office" before Arthur S. Miller's Administrative Law Course, National Law Center, The George Washington University, December 1.

Attended and spoke on "The Changing Role of the General Accounting Office and Government-Business Relations" before the Joint Conference on Issues in Public Law sponsored by the Brookings Institution, Annapolis, Md., February 6-11.

Stephen P. Haycock, associate general counsel:

Spoke on "Problems in Formal Advertising" before the Defense Advanced Procurement Management Course, Fort Lee, Va., November 30.

Spoke before the 2d Legal Logistics Officer Advanced Course at the Judge Advocate General's School, Charlottesville, Va., on "Problems of Negotiated Procurement," January 25.

Robert H. Rumizen, assistant general counsel:

Spoke before the Defense Advanced Procurement Management Course on "Problems in Formal Advertising," Los Angeles, Calif.

Spoke before the National Train-

ing Meeting on Construction Contracting, Department of Agriculture, on "Bid Protests," Denver, Colo., January 30-February 4.

Paul Shnitzer, assistant general counsel:

Spoke on "Problems in Formal Advertising" before the Defense Advanced Procurement Management Course, Fort Lee, Va., January 4.

Participated in the Government Construction Contracting Program and spoke on "Contract Formation," Williamsburg, Va., January 17.

Victor L. Cohen, attorney-adviser, participated in the "Bill of Rights" program conducted by the Council on Younger Lawyers of the Federal Bar Association and spoke on "Freedom of Speech as Guaranteed by the First Amendment," Calvin Coolidge High School, Washington, D.C., December 1.

Oliver H. Easterwood, attorney-adviser, participated in the "Bill of Rights" program conducted by the Council on Younger Lawyers of the Federal Bar Association and spoke on "Rights of Accused at Trial," Woodrow Wilson High School, Washington, D.C., December 8.

Thomas H. Kirkpatrick, attorney-adviser, participated in the "Bill of Rights" program conducted by the Council on Younger Lawyers of the Federal Bar Association and spoke on "Economic Rights and Consumer Protection," Phelps Vocational High School, Washington, D.C., December 9.

Barney R. Putnam, Jr., attorney-adviser, participated in the "Bill of Rights" program conducted by the Council on Younger Lawyers of the

Federal Bar Association and spoke on "Economic Rights and Consumer Protection," Phelps Vocational High School, Washington, D.C., December 9.

Stephen A. Scherr, attorney-adviser, participated in the "Bill of Rights" program conducted by the Council on Younger Lawyers of the Federal Bar Association and spoke on "Fourth Amendment Rights," Calvin Coolidge High School, Washington, D.C., December 1.

Office of Policy and Program Planning

E. H. Morse, Jr., director, addressed the following groups:

The American Management Association Seminar on Operational Auditing Applications on "Operational Auditing," Atlanta, Ga., December 7.

The Chicago Chapter of the Institute of Internal Auditors on "Auditing Government Operations," Chicago, Ill., January 19.

The District of Columbia Institute of Certified Public Accountants on "Auditing Standards for Government Operations," January 20.

Mr. Morse introduced the Comptroller General as the speaker at the February 10 luncheon meeting of the Washington Chapter of the Federal Government Accountants Association.

Lloyd G. Smith, deputy director, addressed the January 12 meeting of the Los Angeles Chapter of the Federal Government Accountants Association on "The Role of the GAO in Improving Federal Program Performance."

William L. Campfield, associate director, addressed the following groups:

Accounting classes at Southern University, Baton Rouge, La., December 7.

Auditing classes at Southern University, New Orleans, La., December 8-9.

Accounting class at the University of Colorado, Boulder, Colo., January 26.

Auditing class at the University of Denver, Denver, Colo., January 27.

Auditing class, University of Michigan, Ann Arbor, Mich., February 22.

Finance and comptrollership classes at the Cleveland State University, Cleveland, Ohio, February 25.

Civil Division

Gregory J. Ahart, deputy director:

Spoke before the Fourth Institute on Grants, Contracts, and Other Federally Funded Projects at the National Graduate University, Washington, D.C., on the "Role of the GAO in Auditing Grants and Contract Programs," October 5.

Participated in a panel discussion held by the Washington, D.C., Chapter of the National Association of Accountants on "Operational Auditing," November 17.

Dean K. Crowther, associate director, and *Willis L. Elmore*, assistant director, addressed the first annual meeting of the American Association for Comprehensive Health Planning, New Orleans, La., December 8. They

spoke on GAO's approach to reviewing comprehensive health planning and participated as discussion panelists.

Archibald L. Patterson, assistant director, and *Jay R. Bolon*, supervisory auditor, attended the Urban Affairs Conference for Federal Officials conducted by the National Institute of Public Affairs, Los Angeles, Calif., December 8-10.

Richard L. Fogel, supervisory auditor, had an article entitled "An Approach for Program Evaluation," published in the November issue of *Educational Technology*.

William C. Oelkers, supervisory auditor, attended the Urban Affairs Conference, Dallas, Tex., January 30-February 4.

Donald J. Vande Sand, supervisory auditor, attended an executive seminar on "Federal Program Management," Kings Point, N.Y., November 28-December 10.

Defense Division

Forrest R. Browne, associate director, spoke to the participants of the Civil Service Commission Executive Seminar on January 19, at Oak Ridge, Tenn. His subject was "GAO: Legislative Oversight on Federal Programs."

John Landicho, assistant director, was a guest lecturer, January 25, at the U.S. Army Logistics Management Center, Fort Lee, Va. He spoke to a group of Army Reserve officers enrolled in the Logistics Executive Development Course on the role and responsibilities of the General Accounting Office.

Sam Pines, assistant director, has been designated Washington coordinator of publications for the forthcoming 21st Annual National Symposium and Exposition of the Federal Government Accountants Association to be held in Los Angeles on June 21, 22, and 23.

Division of Financial and General Management Studies

Donald L. Scantlebury, director, spoke before the Financial Management Institute of the New York Regional Training Center of the Civil Service Commission, January 19, on "New Directions in Financial Management."

On January 18, *Edward J. Mahoney*, deputy director for ADP, and *Harry J. Mason, Jr.*, assistant director, addressed the Library of Congress ADP Automation Seminar. The subject was GAO's report, dated June 30, 1971, entitled "Acquisition and Use of Software Products for Automatic Data Processing Systems in the Federal Government."

Fred D. Layton, associate director:

Spoke to participants of the Civil Service Commission Executive Seminar, Oak Ridge, Tenn., on "Congressional Oversight and the Role of the GAO," January 10.

Led training seminars on "Internal Auditing in Federal Agencies" and "GAO Accounting Principles and Standards for Federal Agencies," on January 27 and 28, for the Department of Commerce Interagency Auditor Training Center.

Keith E. Marvin, associate director,

spoke before the Seminar on Basic and Applied Social Research at Columbia University, New York City, January 19, on "Monitoring of Social Experiments by GAO."

Joseph L. Boyd, assistant director, spoke on "The Use of ADP as an Audit Tool" at the GAO-sponsored Workshop for State Auditors, Kansas City, Mo., January 25.

Kenneth W. Hunter, assistant director, addressed a technical session of the Fall Joint Computer Conference, Las Vegas, Nev., on "The Needs of Congressmen and Their Staffs as Potential Users of Interactive Computer Systems," November 15.

Ted M. Rabun, assistant director, addressed a joint meeting of Beta Alpha Psi and the Accounting Club at the Pennsylvania State University, State College, Pa., on "The Future for Accountants, Auditors and Analysts," January 26.

Field Operations Division

Richard J. Madison, regional manager, and *Kyle E. Hamm*, assistant regional manager, became members of the Atlanta Federal Executive Board in February. This organization's goals are service to the community and improvement in the quality of Federal service.

Zane Geier, audit manager, and *Stanley E. Dyal*, supervisory auditor, Atlanta, participated in a workshop sponsored by the Atlanta Regional Office on February 23 and 24 for State auditors from 12 States. The objective of the workshop was to promote more

effective auditing of grant-in-aid programs at the State and local level.

Mr. Geier represented the Atlanta Regional Office in the January 1972 forum sponsored by the Atlanta Chapter of FGAA for Federal regional audit managers. The forums are organized for the exchange of information and views on changes in audit concepts and work programs.

On January 9, *Myer R. Wolfson*, regional manager, Chicago, participated in a panel discussion on accounting careers before students of the University of Illinois at Chicago Circle Campus.

Irwin M. D'Addario, regional manager, and *James E. Mansheim*, audit manager, Denver, participated with *William L. Campfield*, associate director, Office of Policy and Program Planning, in management seminars for graduate students at the University of Colorado on January 26, and at the University of Denver on January 27. *John E. Murphy*, assistant regional manager, joined the group at the University of Denver on January 27.

Mr. Mansheim and *Earl D. McCartney*, supervisory auditor, Denver, spoke to the Master of Public Administration Association at Brigham Young University, November 16, on problems in Federal programs and GAO's role in dealing with them.

Tony Gonzales, student internee, Denver, participated in a panel discussion on "Job Opportunities for Minority Students in Business," January 27. The discussion was sponsored by the University of Colorado and the Colorado Society of CPAs.

J. H. Stolarow, regional manager,

Los Angeles, spoke before the National Contract Management Association, Antelope Valley Chapter, Lancaster, Calif., January 20. His topic was "Profits in the Defense Industry."

Mr. Stolarow and *G. E. Grant*, audit manager, Los Angeles, taped a presentation "What the General Accounting Office Does for You" which was shown on KCOP—Channel 13, at 10:00 a.m., February 18.

Joseph J. Eglin, Jr., supervisory auditor, Los Angeles, was a team teacher in a Civil Service Commission Course on Accrual Accounting held in San Francisco, January 19–21. On February 2, Mr. Eglin participated in a meeting of the Professional Affairs Committee of the School of Business and Economics, California State College, Los Angeles, on the subject of the intermediate and advanced accounting curriculum.

On February 8, *Gloria G. Hall*, supervisory auditor, Los Angeles, spoke before the Phoenix Chapter of the FGAA on the topic "The New Role of GAO."

Alfonso J. Strazzullo, regional manager, New York, acted as moderator at a seminar presented by the northern New Jersey Chapter of the FGAA, November 18. Representatives from both private industry and Government spoke on matters related to defense contracts.

Walter H. Henson, regional manager, Norfolk, was a guest speaker at the November 1971 meeting of the Federal Executive Association of Greater Tidewater Area of Virginia. He spoke on "The General Accounting Office at Its 50th Anniversary."

On November 11, *Ray Hausler*, audit manager, Seattle, addressed the Puget Sound Chapter of the Planning Executives Institute on the Federal Planning Process. Also, Mr. Hausler was elected vice president of the Puget Sound Chapter for the program year 1971–72.

Neil Rutherford, audit manager, Seattle, participated as a guest lecturer at a seminar held November 16 at the Washington Graduate School of Business. His subject was "Uniform Cost Accounting Standards." Also, Mr. Rutherford discussed "Audits of Management Performance" at the NAA Western Montana Chapter meeting held February 17 in Missoula, Mont.

Leo Kenyon and *Dan O'Toole*, supervisory auditors, Seattle, addressed a special meeting of the Technical Services Division, Atomic Energy Commission, Richland, Wash., October 28, on the subject "Organization and Functions of GAO."

Robert L. Blackstone, *Alvin S. Finegold*, and *Gary D. McGill*, supervisory auditors, Seattle, presented a panel discussion at the Delta Chapter, Beta Alpha Psi, University of Washington, February 1, on the topic "Performance Auditing of Government Programs."

On October 21 and 22, the Seattle Regional Office hosted a workshop on statistical sampling attended by State auditor staffs from Alaska, Idaho, Montana, Oregon, and Washington.

Doug Cameron, audit manager, Portland, has been appointed a member of the Oregon State Society of CPAs' Accounting and Auditing Committee for the program year 1971–72.

International Division

Fred Dziadek, assistant director, participated in the annual convention of the American Economic Association held in New Orleans, La., December 26–29. Major topics considered included problems in international trade, pollution control, and the military-industrial complex.

Stewart L. Tomlinson, audit manager, participated in the seminar on “International Affairs and Federal Operations” held at the Executive Seminar Center, Kings Point, N.Y., January 16–28. Top-level officials of major Federal agencies attended the seminar which dealt with basic concepts of the development of U.S. foreign policy, the conduct of foreign affairs, and the international pressures which influence domestic policymakers.

Transportation Division

T. E. Sullivan, director, attended the meeting of the Revenue Accounting Committee of the Association of American Railroads, Atlanta, Ga., February 14–15. He briefed the Committee on the implementation of the Joint Agency Transportation Study recommendations, including the result of a recent test involving the Government bill of lading, and discussed problems of mutual concern in the settlement of rail carriers’ accounts with the Government.

F. J. Shafer, deputy director, was

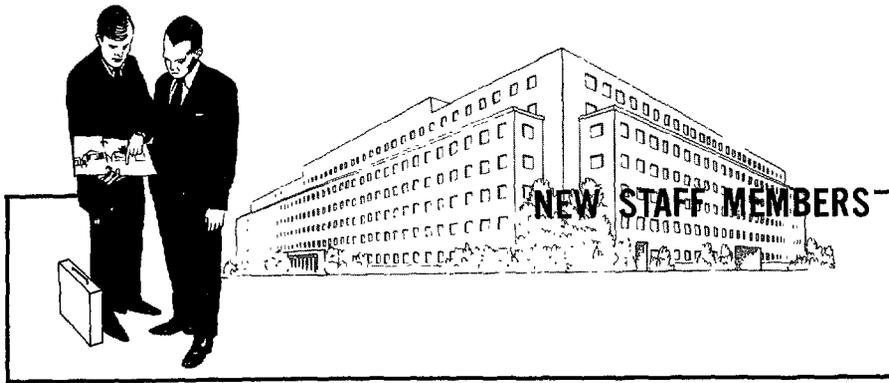
elected to the Board of the Washington, D.C., Chapter, Transportation Research Forum, in January 1972.

H. W. Connor, associate director, attended the Brookings Institution Conference for Federal Management and Program Executives, Williamsburg, Va., February 7–18.

C. R. Comfort, assistant director, attended the Transportation Management Program at Columbia University, New York City, February 2–18.

J. M. Loxton, assistant director, attended Systems Management Week conducted by the American Management Association, New York City, March 6–10. The program included the subjects systems of computers, generation of users, and dispersal of computing power.

W. F. McDade, supervisory transportation specialist, and *Lowell James*, supervisory management auditor, attended the semiannual meetings of the Cargo and Passenger Revenue Accounting Committees of the Airline Finance and Accounting Conference, Washington, D.C., March 21–23. Mr. McDade discussed the procurement and payments on excess baggage with relation to the Government Excess Baggage Authorization Ticket and other problems encountered by carriers in connection with Government traffic. Mr. James reported on the implementation of the Joint Agency Transportation Study recommendations.



The following new professional staff members reported for work during the period November 16, 1971, to February 15, 1972.

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| Civil Division | Kupchik, Andrew P. Spengler, Emerson D., Jr. | King's College Pennsylvania State University |
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|-------------------------|--------------------|---------------------|
| Defense Division | LaVallee, Ralph S. | U.S. Postal Service |
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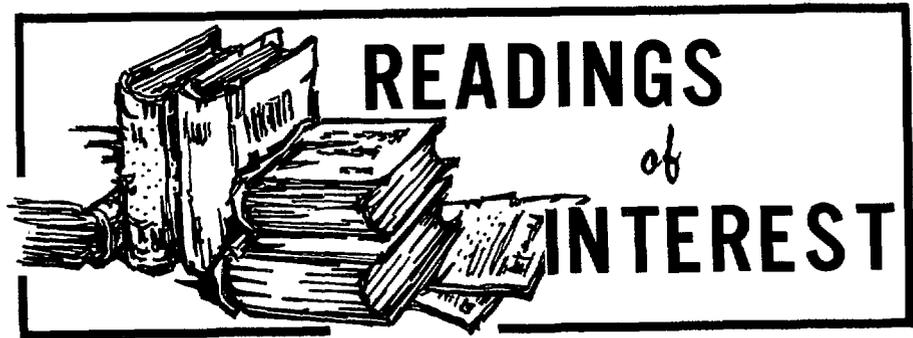
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|---|---------------------|-----------------------------|
| Division of Financial and General Management Studies | Chastain, Dennis R. | Defense Intelligence Agency |
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REGIONAL OFFICES

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|-------------------|--------------|--------------------|
| Cincinnati | Cox, Paul E. | Indiana University |
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| Los Angeles | Meyers, Ronald D. | Oregon State University |
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| San Francisco | Ellsberg, Patrick G. | Chico State College |
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The reviews of books, articles, and other documents in this section represent the views and opinions of the individual reviewers, and their publication should not be construed as an endorsement by GAO of either the reviewers' comments or the books, articles, and other documents reviewed.

The Use of Sophisticated Analytical Methods for Decision Making in the Aerospace Industry

By Clayton Reeser, Associate Professor of Management, University of Hawaii; *MSU Business Topics*, Autumn, 1971.

This brief article, in the quarterly magazine of the Graduate School of Business Administration of Michigan State University, addresses the questions of just how extensively sophisticated analytical methods are used by managers in making decisions and whether some writers on management subjects have not subordinated the role of subjective decision making in real life. Because of the flood of writing in recent years on the virtues of analytical techniques to managers, these questions are well worth pursuing.

In a modest study involving 20 project managers at three major west coast aerospace companies, Professor

Reeser concludes that: "Even with this research sample of twenty subjects specifically trained to approach problem solutions objectively, and a sample drawn from an industry in which quantitative methods have been stressed for the past fifteen years, subjective bases for decision making were mentioned over three times as frequently as sophisticated methods of analysis." He also reported that nine of the 20 subjects did not mention a single sophisticated analytical method as being valuable to them in making any of their important decisions. None of the project managers, for example, testified to using linear programming for "make or buy" decisions although textbooks usually explain this technique in terms of such decisions.

The author cites four possible reasons for the incongruence between the emphasis on sophisticated techniques in management literature and business school curricula and his research findings:

1. Managers may be unaware of their existence and/or potential usefulness.
2. The cost of developing and maintaining complicated bases for decision making cannot be afforded.
3. The time in which decisions must be made does not permit the orderly development of objective solutions.
4. Despite their apparent sophistication, the highly popularized modern quantitative methods are abstractions from real life and incompletely cover all of the variables and interactions between variables that are present under actual decision-making conditions.

Professor Reeser rules out the first two. The third is accepted as a partial explanation. The fourth reason, together with the third, is cited as constituting most of the explanation as to why objective analytical models may not be practically applied to decision making to any great extent. He concludes by observing that: "Perhaps the ability of the human mind to assemble all of the elements in a situation, assign intuitive weights to them, and come quickly to a satisfactory solution still surpasses rational models processed through a computer."

The article is helpful in bringing a little more balance to the literature of this highly technical field. Most of the writing on the subject is explanatory of how decisions involving quantitative or measurable factors might well be made, at least theoretically. However,

there seems to be very little published writing by decision-making managers explaining their reactions to sophisticated techniques and how they actually reach decisions. Professor Reeser's article is a short step in the direction of seeing the other side.

E. H. Morse, Jr.,
 Director,
 Office of Policy and Program
 Planning.

Financial Management in the Federal Government, Volume II

U.S. Senate Committee on Government Operations, 92d Congress, 1st Session (S. Doc. 92-50), Government Printing Office, Washington, D.C., 1971, 491 pp.; \$1.75.

This compact paperback is, in the sense of its sponsor, the Committee on Government Operations, U.S. Senate, the second of a continuing series to periodically provide a current record of developments in the complex activities involved in managing the financial affairs of the Federal Government. The first volume, published in February 1961, traced financial management in the Federal sector from the early 19th century through the 86th Congress which ended in December 1960.

The current volume, as its cover page subtitle explains, is "selected information on financial developments in the Federal Government and on legislation, both prepared and passed, 87th through 91st Congresses." The period covered is calendar year 1961 through calendar year 1970. Because the de-

mand over the years for the first volume exhausted the only printing, the sponsor decided that for convenience Volume I would be included as an appendix to Volume II. Consequently, the reader of the current volume has literally "two books for the price of one."

Of the 491 pages in the monograph only 109 pages, Volume II, are devoted to the years 1961-70. Since in the judgment of this reviewer the decade of the 1960's was more relevant than prior periods to financial management styles and practices of today this review will focus only on the happenings of the last decade.

Volume II is divided into three parts, namely: (1) Financial Management Legislation, 87th-91st Congresses (1961-70), (2) Developments in Government-wide Financial Management, 1961-70, and (3) Agency Developments in Financial Management, 1961-70.

Part I represents a selection from among the 3,600 public laws enacted by the 87th through 91st Congresses of the laws or portions of laws relating to significant financial management matters. The items discussed are arranged within the following topics:

- Congressional attempts to control the budget
- Provisions of the Legislative Reorganization Act of 1970
- Budgetary and fiscal operations
- Federal grants-in-aid to State and local governments
- Other financial management legislation

Part II of the current report discusses several significant undertakings during the 1960's toward improving the budgetary process and providing better information systems Government-wide. Thus we find 10 pages devoted to the study and recommendations of the President's Commission on Budget Concepts. Nine pages of discussion follow on the history and implementation of Planning-Programming-Budgeting Systems (PPBS) in the Federal agencies. A very interesting part of this discussion is a summary of progress and potential for PPBS. Part II also describes the objectives and selected improvement activities carried on under the direction of the Joint Financial Management Improvement Program which began in 1948 as a result of the combined efforts of the central fiscal agencies, namely, the Bureau of the Budget (now the Office of Management and Budget), the Department of the Treasury, and the General Accounting Office. At the request of the other members, in 1966 the Civil Service Commission joined as coleader of the program to assist in the personnel aspects of financial management.

Part III consisting of 23 pages highlights expanding financial management responsibilities and activities of the central agencies (Bureau of the Budget, Civil Service Commission, General Accounting Office, and Treasury Department) during the 1960's.

Although the General Accounting Office had the responsibility for coordinating the drafting of material and the final editing of Volume II, staffs from the central agencies and the Congressional Research Service made val-

uable contributions to the final product.

Senator John McClellan, chairman, Senate Committee on Government Operations, in his December 13, 1971, transmittal letter to the President of the Senate has this to say about Volume II:

* * * The value of the first report is attested by the wide use made of it both in and out of Government, by legislative and executive officials, and by researchers and teachers in the field of financial management. Certainly, no less use can be expected of this

volume which updates the first, in view of the many important financial developments in the Federal Government over the past 10 years.

This reviewer from his perspective of personal researching and sharing experiences with other researchers and teachers heartily endorses the assessment of Senator McClellan.

W. L. Campfield,
Associate Director,
Office of Policy and Program
Planning.

He [man] tends increasingly to confine himself to the things he does well and to avoid the things in which he has failed or has never tried.

We pay a heavy price for our fear of failure. It is a powerful obstacle to growth. It assures the progressive narrowing of the personality and prevents exploration and experimentation. There is no learning without some difficulty and fumbling. If you want to keep learning, you must keep on risking failure—all your life. It's as simple as that.

John W. Gardner
Self-Renewal, The Individual and The Innovative Society.



50th Anniversary Correspondence

The following are excerpts from letters received by the Comptroller General, Elmer B. Staats, from recipients of copies of the Summer and Fall 1971 issues of the Review.

I congratulate you on the Summer and Fall issues of the GAO REVIEW, which you sent with your letter of November 12, 1971, and upon the 50th anniversary of the General Accounting Office. Your contribution has been great to the useful and illustrious record that the GAO has made. My own observation has been that the GAO is the most effective influence toward improved administration and management that the Federal Government has going for it. I imagine that anyone who served in a Bureau 12 years as I did could provide from his experience several significant examples of contributions made by the GAO. I know that I can from the old Bureau of Reclamation days. Ten years later I borrowed the accounting and program control system of the Bureau for the

purpose of using it in building the California State Water Project. It worked in California, too.

William E. Warne,
Formerly Commissioner of
Reclamation,
Assistant Secretary of the Interior.

Thank you for sending members of NAPA the two interesting and extremely informative issues of the GAO REVIEW. Your editors brought a lot of history together. Some of it makes me realize how old I have become, but I enjoyed reacquainting myself with old friends of another era.

Roger W. Jones,
Office of Management and Budget.

I'm grateful to you for sending me the two issues of Commemorative Activities. They will be extremely useful in my writing and teaching. I was particularly interested in the account of the Corporation Audits Division because I served it as consultant for two years at the time it was created.

Congratulations on an excellent job.

Marshall E. Dimock

Proposal Studies

The article entitled "A Method and Format for Proposal Studies" which was contained in the Winter 1972 edition of *The GAO Review* represents an interesting but limited description of the conduct of what the author has defined to be "proposal studies." In order to be responsive and to increase the value of our reports to the Congress, "proposal studies" must include more than "* * * extensive interviewing of experts coupled with comprehensive research of relevant literature" as the author implies.

In his discussion of differences between proposal studies and audit reviews, the author states that proposal studies deal less often with facts and figures. The word "fact" is defined by Webster's as a thing done. If we generalize by saying that proposal studies are based on reviews of plans while audit reviews are based on reviews of history, then the distinction the author is making can be viewed as semantic rather than real. Reports on audit reviews contain facts and figures that we obtain from a review of the agency's *activities* that are in process or are completed. Similarly, reports of proposal studies contain facts and figures that we obtain from a review of the agency's *plans* that are in process or are completed. Further, much of the information contained in plans and proposals is based on history and should therefore be subjected to the same scrutiny as "audit reviews."

I am afraid that if we intentionally limited the contents of our reports to the information obtained from the

hearsay evidence that is obtained by searching literature and interviewing, our reports would not have the authenticity or specificity that is necessary for the report to be of assistance to the Congress in their assessment of an agency's proposed programs. In my opinion, authenticity and specificity can be obtained by a thorough review and assessment of the expected costs, capabilities, effectiveness and benefits that are described in the reports and analyses that an agency has prepared and considered before making its decision that a particular program should be proposed for Congressional approval. A review of the agency's reports and analyses allows GAO to provide the Congress with a summary of the information upon which the agency decided that a program should be proposed. GAO's assessment of the agency's reports and analyses can provide the Congress with an independent evaluation of the reasonableness and validity of the agency's basis for proposing a program.

Although the author implies that researching literature and interviewing experts should be the primary methods of obtaining information to be included in reports of "proposal studies," both the conduct of the guided missile studies and the reports thereon cited by the author relied heavily on the information contained in documents that were prepared by the Department of Defense. These documents included selected acquisition reports, studies of missile system components, cost-effectiveness analyses, plans for future force structures, and reported results of actual use of missiles in

Vietnam and test firings of missiles in the United States. For example, a major portion of one of the reports and lesser portions of the other reports were devoted exclusively to a review and assessment of the cost-effectiveness analyses that were conducted by the Department of Defense to compare proposed missiles with existing missiles in order to evaluate the relative merits of the competing missile systems.

While I agree that GAO should research literature and interview experts during the conduct of "proposal studies," I believe these same review methods should be utilized in "audit reviews." These methods provide the GAO staff with information that is useful in assessing the agency's positions and reports; however, in my opinion, the primary source of the information that GAO includes in its reports to the Congress should continue to be the records and documents that originate within the agency.

Arthur R. Goldbeck,
Operations Research Analyst,
Division of Financial and
General Management Studies.

The Author Rejoins

As the author of "A Method and Format for Proposal Studies" which appeared in the Winter 1972 issue of the *GAO Review*, I have looked over Mr. Goldbeck's comments. . . .

Mr. Goldbeck's main thrust is against the article's proponentcy, as he sees it, of literature sources over official documents in the course of researching a proposal. He must have

interpreted the term "literature" to embrace only such writings as magazine articles, texts and private works, and that official documents are excluded.

As a matter of fact, "the literature" of a subject—as all the principal dictionaries define it—includes *all* the writings on that subject, and so the literature referred to in the article included official documents of the Department of Defense about missile research, planning, analysis, testing, cost-effectiveness studies and the like. As the article says on page 68, about 200 DOD documents were consulted in the course of the studies. About 90% of the sources cited in the bibliographies in B-160212 and B-160212-1 are official literature.

Mr. Goldbeck himself mentions the heavy reliance that was placed on DOD documents, and in doing so he hoists himself on his own definitional petard: "Although the author implies that researching literature and interviewing experts should be the primary methods * * * the guided missile studies and the reports thereon cited by the author relied heavily on documents that were prepared by the Department of Defense". Thus he mistakenly identifies official documents as a class of writings apart from "the literature" on a subject.

(In the strictly classical sense of the term "literature", however, Mr. Goldbeck is devastatingly correct. DOD reports, God save the mark, are far from belles-lettres!)

Perhaps Mr. Goldbeck is intending that input to GAO studies should be limited to official documents. As im-

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plied in the article I would disagree, but it is too large a subject to discuss in a letters-to-the-editor exchange. . . .

Timothy D. Desmond,
Supervisory Management
Analyst,
Defense Division.

Writing Reports

I was very impressed by Lowell Mininger's article, "A Commonsense Approach to Writing Reports." I found it well written and delightfully illustrated. As you know I have been very much involved in the advocacy of improved communications in accounting and so am always ready to give my unsolicited response to articles of this kind.

When the preparer of a report depends on a report manual to aid him in grinding out a standard product the result can be disastrous. Somehow standard reports are something like uniforms. All people do not look as well in the same style clothing. Of course, we do need some standards for communication consistencies, such as agreement on basic terms for legal protection.

The author's starting point, finding your message, is one which a number of report writers seem to skip. I cannot help but relate this to the speaker who, with his prepared speech in his hand began by looking up from his paper and saying "before I give my speech, I would like to say something." (Political candidates, please note.) This inadvertent confession is a

luxury that most report readers do not have. Unfortunately they must read the report before they realize nothing is being said.

I particularly like the author's phrasing where he says "You will soon discover that getting across your message is a venture in the art of persuasion." I believe that in writing one should keep before him a vision of the listener, and keep saying: am I reaching the listener; does the listener care what I am saying?

One device that should be avoided is extensive use of the so-called "buzz" words. I have often sat back in audiences and listened to my fellow academicians address the group and use phrases which may have meaning to me and to other academicians but mean very little to those outside of our hallowed halls. I refer to such words as inter-disciplinary, syllabi, and curriculum, but every group has its pet words, designed to impress rather than express. We often forget that the reader may not have the same background and, therefore, not understand what to us is a working vocabulary. The objective of writing a report is not to overwhelm the reader with how much we know but to communicate to him something we would like him to know.

Again, my compliments to Mr. Mininger for giving us such a useful, well thought out approach to the art of preparing reports.

James H. MacNeill,
Dean, College of Business
Administration,
Fordham University.

Annual Awards for Articles Published in The GAO Review

Cash awards are available each year for the best articles written by GAO staff members and published originally in *The GAO Review*. Each award is known as the Award for the Best Article Published in The GAO Review and is presented during the GAO awards program held annually in June in Washington.

One award of \$250 is available to contributing staff members 35 years of age or under at the date of publication. Another award of \$250 is available to staff members over 35 years of age at that date.

Staff members through grade GS-15 at the time of publication are eligible for these awards.

The awards are based on recommendations of a panel of judges designated by the Comptroller General. The judges will evaluate articles from the standpoint of the excellence of their overall contribution to the knowledge and professional development of the GAO staff, with particular concern for:

Originality of concepts.

Quality and effectiveness of written expression.

Evidence of individual research performed.

Relevancy to GAO operations and performance.

Statement of Editorial Policies

1. This publication is prepared for use by the professional staff members of the General Accounting Office.
2. Except where otherwise indicated, the articles and other submissions generally express the views of the authors, and they do not necessarily reflect an official position of the General Accounting Office.
3. Articles, technical memorandums, and other information may be submitted for publication by any professional staff member. Submissions may be made directly to liaison staff members who are responsible for representing their offices in obtaining and screening contributions to this publication.
4. Articles submitted for publication should be typed (double-spaced) and range in length between five and 14 pages. The subject matter of articles appropriate for publication is not restricted but should be determined on the basis of presumed interest to GAO professional staff members. Articles may be submitted on subjects that are highly technical in nature or on subjects of a more general nature.

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