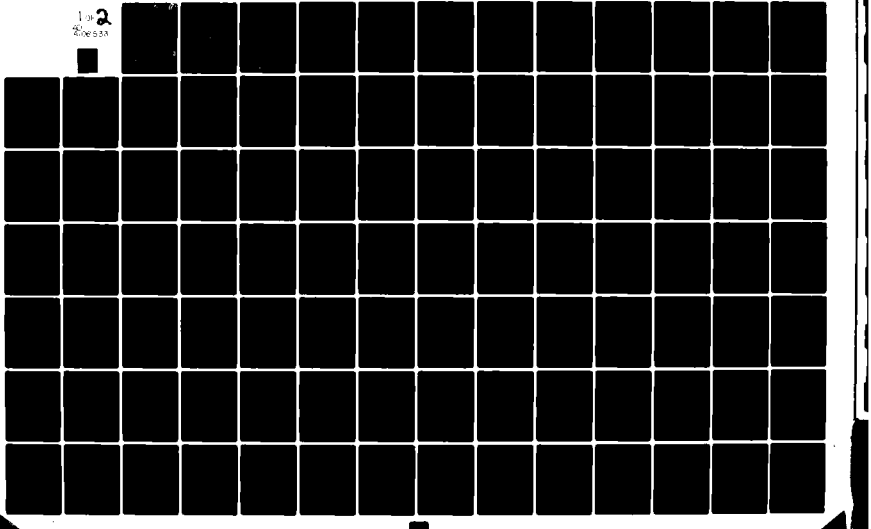
AD-A106 533 GENERAL ACCOUNTING OFFICE WASHINGTON DC COMMUNITY AN--ETC F/G 5/1
DEPARTMENT OF AGRICULTURE NEEDS LEADERSHIP IN MANAGING ITS INFO--ETC(U)
JUN 81
UNCLASSIFIED GAO/CED-81-116

NL



LEVEL II

BY THE COMPTROLLER GENERAL

Report To The Chairman, Committee On Government Operations, House Of Representatives OF THE UNITED STATES

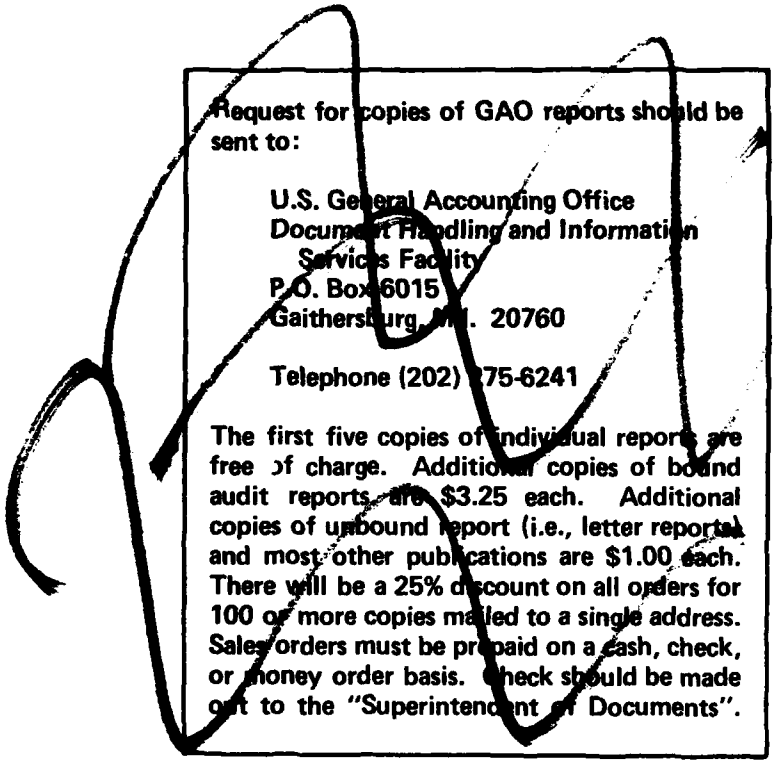
Department Of Agriculture Needs Leadership In Managing Its Information Resources

A strong central management office and greater top management involvement will be necessary if Agriculture is to provide the leadership and direction that is needed for its growing investment in computer and information resources.

The Department must also better plan for its information resources activities. Its computer centers must be run more efficiently, and its control of and accountability for software development must be tightened. Finally, the Department must place a higher priority on the security of its information resources.

The senior official appointed under the Paperwork Reduction Act of 1980 should develop an information resources management program for the Department and its agencies which would be responsive to GAO's recommendations for improvement.

CED-81-116
JUNE 18, 1981



Request for copies of GAO reports should be sent to:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, MD. 20760

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are $3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are $1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".

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

B-203507

The Honorable Jack Brooks
Chairman, Committee on
Government Operations
House of Representatives

Dear Mr. Chairman:

Pursuant to your request, we have reviewed the effectiveness of the Department of Agriculture's computer and information resources. The review includes an evaluation of the Department's automatic data processing organization and structure, management functions, and security activities.

This report identifies problems the Department of Agriculture is experiencing in managing and using its computer and information resources. We believe that the Paperwork Reduction Act of 1980, if effectively implemented by the Department, will foster the improvements in information resources management that this and other reports show is so badly needed.

Based on your wishes, we did not obtain written agency comments or discuss our conclusions and recommendations with agency officials except those dealing with implementation of the Paperwork Reduction Act. This discussion, cleared through your office, was necessary so that we could present our views to USDA officials before the senior official was designated. Department officials acknowledged our recommendations but said they had only begun to study the implications of the act and, therefore, could not respond at this time.

As arranged with your office, we will not make distribution of this report until 30 days from this date. At that time, we will send it to interested parties and make copies available to others upon request.

Sincerely yours,

Milton J. Socolar

Acting Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CHAIRMAN
COMMITTEE ON
GOVERNMENT OPERATIONS
HOUSE OF REPRESENTATIVES

DEPARTMENT OF AGRICULTURE NEEDS LEADERSHIP IN MANAGING ITS INFORMATION RESOURCES

D I G E S T

The U.S. Department of Agriculture (USDA) needs to better manage its computer and information resources if it is to meet the demands of its users. Restructuring its ADP organization under a senior official with strengthened authority is a must if USDA is to deal with the many information resources problems it faces.

USDA's program effectiveness largely depends on computers and related information resources. Information technology helps its agencies provide the public with more, better, and faster service at a lower cost and with fewer people.

STRONG MANAGEMENT IS NEEDED

For several years problems have been identified in USDA's management and use of information resources. Yet, little has been done to solve these problems. The current central automatic data processing (ADP) office acts more as a coordinator and advisory office than as the manager of critical information resources. It does not have the required authority to ensure effective and efficient management and use of information resources. It also has no authority over agency in-house development efforts and has not developed an oversight mechanism to ensure that agencies are complying with its security regulations.

In passing the Paperwork Reduction Act of 1980, the Congress mandated that each agency appoint a single senior official with authority and responsibility for ensuring effective and efficient information resources management. This official must report to the agency head. If effectively implemented, the act should materially improve USDA's information resources management. (See ch. 2.)

CED-81-116

In April 1981 the Secretary named his Executive Assistant as USDA's senior official. No other action had been taken to implement the act because USDA needed more time to study its implications.

GAO recommends that the Secretary of Agriculture

--establish a separate central information resources management office headed by the senior official;

--include as part of the new office such information-related subcomponents as are deemed necessary for the senior official to carry out his responsibilities;

--direct the senior official to develop and implement an information resources management program for the Department and its agencies;

--establish a top-level USDA steering committee or similar group of agency representatives to provide the senior official with advice and recommendations on policy and other significant information resources management matters; and

--direct agencies and offices to establish central information management units subject to the review and approval of the senior official.

(See pp. 27 and 28 for additional recommendations.)

MORE GUIDANCE AND CONTROL WILL IMPROVE SOFTWARE DEVELOPMENT

Development, conversion, and maintenance of applications software is not effective because management practices generally accepted in the information systems profession are not followed. Agencies frequently do not prepare requirements analyses, cost/benefit studies, or comprehensive project plans. Nor are full-time project managers with authority, responsibility, and accountability always assigned to software projects.

These poor management practices have contributed to time and cost overruns on software development projects.

The National Finance Center's payroll redesign project will be completed 3-1/2 years behind schedule. Farmers Home Administration's Unified Management Information System could cost $42 million to complete as designed--an overrun of $25 million. USDA has been studying Farmers Home Administration's system alternatives for ways to correct its management and technical problems. The total development costs for an alternative system may range from $27.5 million to $42 million. Delays in completing software projects are causing newly installed modern equipment to be underused while the use of obsolete computers continues. Also, software maintenance activities are poorly managed. (See ch. 3.)

GAO recommends that the Secretary of Agriculture provide the senior official with clear responsibility and authority over software. With this mandate from the Secretary, the senior official should

--establish formal procedures and policies to control major software projects to ensure that accepted ADP management practices are being used and

--establish a technical assistance center for computer software and systems development.

(See p. 46 for additional recommendations.)

USDA COMPUTER CENTERS MUST BE RUN MORE EFFICIENTLY

Users of four USDA computer centers have expressed their dissatisfaction with availability, accessibility, and response times. In dealing with capacity problems, the centers have looked to more equipment as the solution. Unnecessary demands on available computer resources could be reduced by more efficient practices such as reviewing applications for ways to improve performance. The centers' problems are aggravated by serious delays in converting software applications from old equipment to new computers. As a result, obsolete equipment is being used instead of newer, more efficient computers. (See ch. 4.)

GAO recommends that the Secretary of Agriculture direct the senior official to

establish a computer performance management program including objectives for user service levels; uniform reporting on performance, capacity, and utilization; and standard operating procedures related to efficient use of computer center resources.

(See p. 60 for additional recommendations.)

ADP SECURITY NEEDS A HIGHER PRIORITY

USDA agencies have placed too little emphasis on ADP security. Controls to prevent unauthorized access to computer files are weak. Physical controls over equipment and buildings need improvement. Inadequate security planning for continuing processing in the event of a disaster increases USDA's vulnerability to loss. (See ch. 5.)

USDA should strengthen its ADP security program. GAO recommends that the Secretary of Agriculture direct the senior official to

--vest USDA security officers with sufficient authority to enforce ADP security regulations and

--include, as part of his periodic reviews of information management activities required by the Paperwork Reduction Act, evaluations of agencies' compliance with USDA security regulations.

A COMPREHENSIVE PLANNING PROCESS IS NEEDED

USDA has not established a comprehensive planning process--a recognized keystone for effective ADP management. Such a process requires an organization to define its goals in relation to mission requirements, set priorities for achieving these goals, and measure the results through a systematic feedback process.

Lack of emphasis on comprehensive planning has resulted in inefficient and ineffective use of information resources that has contributed to cost overruns of millions of dollars for six large software projects. (See ch. 3.) In addition, deficient planning has contributed to (1) continual problems in maintaining sufficient capacity at computer centers to provide consistent,

quality service and (2) increasing vulnerability to extended processing interruptions in the event of a disaster. (See ch. 6.)

GAO recommends that the Secretary of Agriculture direct the senior official to

--develop guidelines for a comprehensive, long-range planning process for managing information resources and

--direct the agencies to adapt their planning process to guidelines developed by the senior official.

AGENCY COMMENTS

In line with the House Government Operations Committee's wishes, GAO did not obtain comments on this report or discuss with USDA officials the conclusions and recommendations, except those dealing with implementation of the Paperwork Reduction Act. With the concurrence of the committee's office, GAO did discuss its proposed recommendations for implementing the act with USDA officials in March and April 1981 because it was important that GAO present its views before the senior official was designated. The USDA officials acknowledged GAO's recommendations but said they had only begun to study the implications of the act on USDA and, therefore, could not respond at this time.

Contents

ABBREVIATIONS

ADP	automatic data processing
ASCS	Agricultural Stabilization and Conservation Service
CAS	central accounting system
CPM	computer performance management
CPU	central processing unit
FCCC	Fort Collins Computer Center
FmHA	Farmers Home Administration
GAO	General Accounting Office
GSA	General Services Administration
KCCC	Kansas City Computer Center
MFO	Management Field Office
NFC	National Finance Center
O&F	Office of Operations and Finance
OIG	Office of the Inspector General
OMB	Office of Management and Budget
SLCC	St. Louis Computer Center
UMIS	Unified Management Information System
USDA	U. S. Department of Agriculture
WCC	Washington Computer Center

CHAPTER 1

INTRODUCTION

In response to a letter from the Chairman, House Committee on Government Operations, we have reviewed the U.S. Department of Agriculture's (USDA's) central automatic data processing (ADP) management and organizational structure. The chairman requested the review because he was concerned that

--the Secretary of Agriculture's October 1977 reorganization had weakened USDA's central ADP management office by combining ADP with financial, procurement, and other administrative functions;

--the Farmers Home Administration (FmHA) was continuing to have significant problems developing its large-scale Unified Management Information System (UMIS);

--serious deficiencies prevailed in USDA's ADP management and operations as disclosed in the large number of reports issued since 1975 by us and the USDA Office of Inspector General (see apps. I and II); and

--the deficiencies existing at USDA's National Finance Center (NFC) were symptomatic of weak central ADP management.

Problems such as these, which exist throughout the Government, were instrumental in the passage of the Paperwork Reduction Act of 1980 (Public Law 96-511), enacted on December 11, 1980. One objective of the act was to strengthen Federal information management activities.

The chairman also requested that we begin our work by investigating the need for NFC to noncompetitively procure an interim computer. The chairman asked for a quick response on the results of our work because NFC stressed its urgent need for this acquisition. Therefore, we provided an oral briefing to the committee staff on October 12, 1979. We told them that management deficiencies associated with missed completion dates of critical NFC ADP software projects (the payroll/personnel system redesign and the conversion of software from old to new equipment) had resulted in (1) additional costs to retain old computers, (2) costs to acquire additional computer equipment or capacity, and (3) delayed benefits to users. We concurred with NFC's plans to acquire an old, surplus computer solely for backup during the redesign period instead of a newer, more expensive computer. Subsequently, NFC procured the surplus computer on an interim basis.

CONGRESSIONAL CONCERN ABOUT USDA's ADP MANAGEMENT

The House Government Operations Committee has been concerned about the ADP management structure in place at USDA and other Federal agencies. The committee's position is that a strong management structure is critical to an agency or department successfully applying ADP and other information technology to the support of Government programs. The committee's concern is evident from its letters to the Secretary of Agriculture and other agency heads, from its recent investigations of FmHA's UMIS project and the Air Force's phase IV program, and from its efforts to promote passage of the Paperwork Reduction Act of 1980.

The committee's report on FmHA's UMIS project 1/ expressed the following concerns with the ADP structure in USDA:

> "The inability of the Department's central ADP management office to take early and effective action to correct the deficiencies of the UMIS project, raises serious doubts about this office having sufficient authority to exercise its responsibilities."

The chairman sent letters to various agency heads stressing the importance of a strong ADP management structure. In a March 1980 letter, he stated that the need for stronger management of agencies' ADP resources is the major issue which his committee has been focusing its attention on for the past several years. In another instance, because his committee viewed USDA's 1977 reorganization as diluting the central ADP management authority within the Department, the chairman sent a letter on March 21, 1978, to the Secretary of Agriculture expressing this concern.

But perhaps the best indication of the committee's interest in the structure of ADP management for Federal agencies is the Paperwork Reduction Act of 1980. The committee issued its report 2/ on the bill, H.R. 6410, on March 19, 1980. The bill was introduced by the chairman and other members of the House Government Operations Committee. In its report the committee stated,

---

1/"Management Failures in Developing the Farmers Home Administration's Unified Management Information System," House Report No. 96-1403, September 26, 1980.

2/House Report No. 96-835 (96th Cong., 2d session, Mar. 19, 1980).

"This legislation is the result of the committee's oversight of several of the agencies affected by H.R. 6410. The committee has held a number of hearings relating to the need for a strong management structure for information resources."

The act creates a new management structure for the Government's information activities, including ADP. First, within the Office of Management and Budget a central office is established with broad responsibilities for developing consistent information policies and overseeing agency activities. Second, within each agency a senior-level official is to be designated who will be held accountable for ensuring that the agency effectively carries out its information management activities.

Congressional committees and individual congressmen have also expressed concern about other aspects of USDA's ADP management. These concerns have dealt with physical and data security, large-scale software development projects, and noncompetitive computer procurements. Most of the reports listed in appendix I were our response to these concerns.

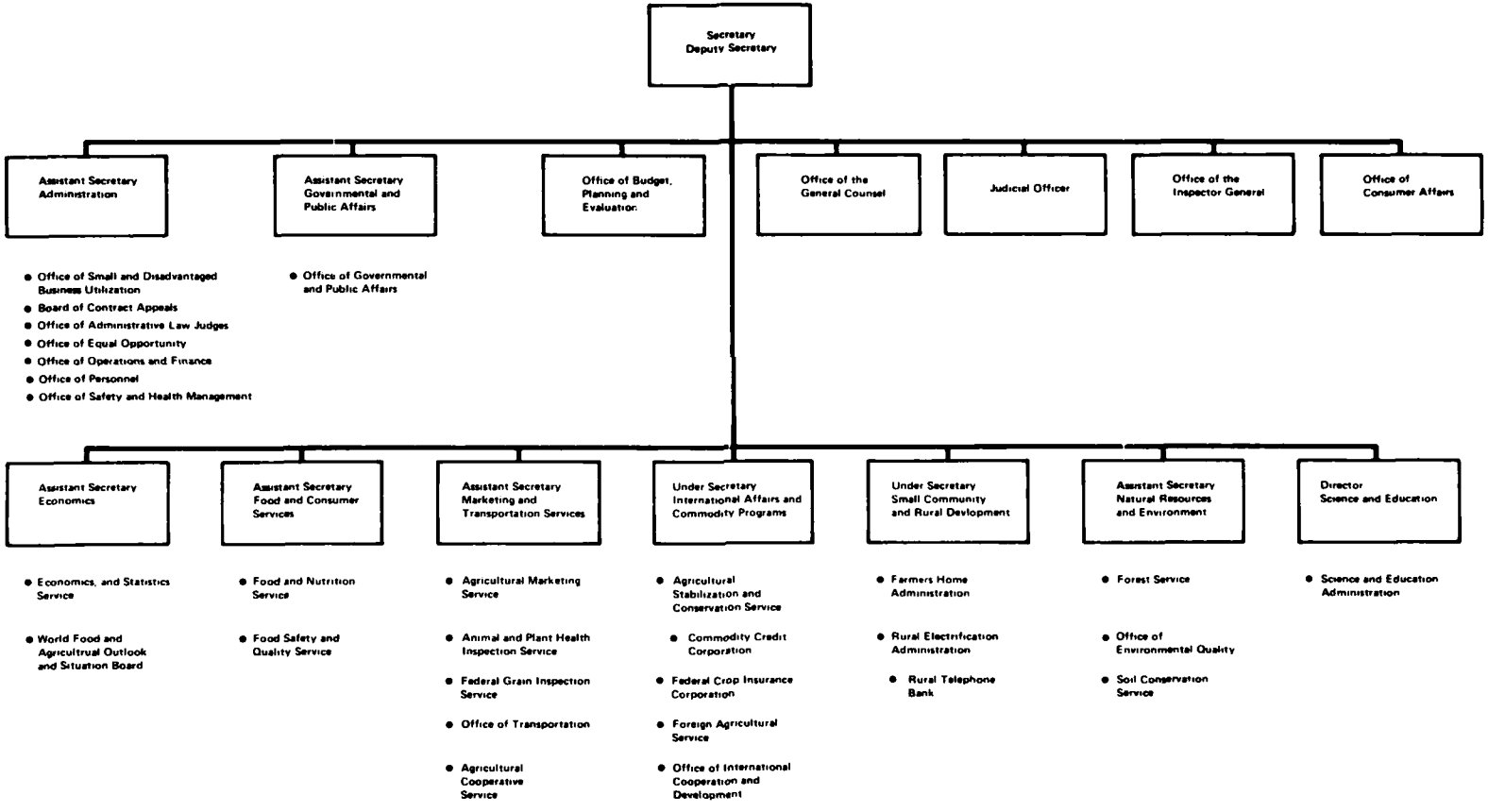
USDA RELIES ON ADP TECHNOLOGY TO MEET PROGRAM REQUIREMENTS

USDA has responsibility for several broad missions encompassing over 300 separate programs that are managed by USDA agencies and offices. (See chart on p. 4.) These programs include home loans to farmers, rural development, commodity price support loans, conservation, nutrition, food assistance, agricultural research and education, and national forest management. The goal of ADP management at USDA is to develop effective and efficient data processing systems and applications to help carry out these programs and provide quality service to the American people.

USDA's program effectiveness largely depends on computers, telecommunications, and related information resources. The organizational structure established to manage these resources consists of a central office and the individual structures set up at each of the agencies. 1/ The central ADP office is the Office of Data Services, which is part of the Office of Operations and Finance under the Assistant Secretary for Administration. (See chart on p. 5.) At USDA, responsibility for ADP management is shared by the central office and the agencies.

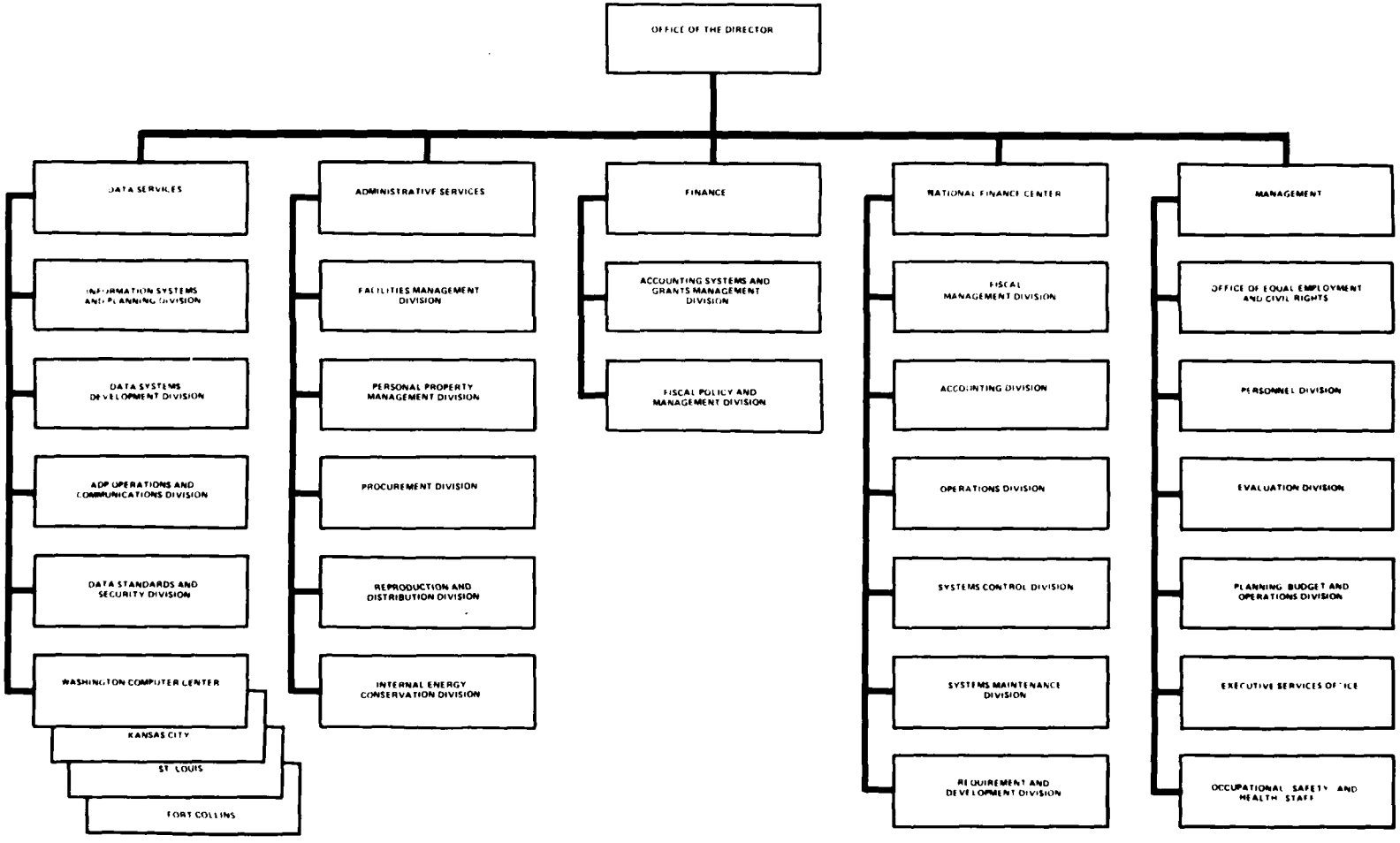
1/As used in this report, the term "agency" includes designated agencies and other staff offices.

United States Department of Agriculture



GAO note During processing of this report a current USDA organization chart was not available This chart was developed based on information provided to us by the Office of Personnel

U. S. DEPARTMENT OF AGRICULTURE
OFFICE OF OPERATIONS AND FINANCE



Source USDA Office of Operations and Finance

To keep up with their expanding responsibilities, USDA managers, scientists, analysts, and other personnel are relying more on ADP and telecommunications technology. Computers help them to provide more, better, and faster service; do things which could not be done without computers; and provide services at less cost or with fewer people. Budget data shows that ADP and telecommunications obligations have almost doubled in USDA since 1977 when obligations were about $81.5 million. Estimated obligations for fiscal year 1981 are $158 million.

ADP and telecommunications technology are critical resources for NFC, the Forest Service, the Agricultural Stabilization and Conservation Service (ASCS) and FmHA--four of USDA's largest ADP users.

National Finance Center

NFC is USDA's central administrative processing facility. Formed in 1973 through the merger of the departmental payroll and administrative payments centers, NFC is now part of the Office of Operations and Finance. NFC's mission is

> "* * * to accomplish the Department's automated personnel, fiscal, accounting and payroll functions and to provide all levels of management with timely and accurate information for the management of financial and human resources."

These processes are heavily automated, making NFC a major user of computer support. Of NFC's $27.7 million total fiscal year 1980 budget, we estimated that ADP accounted for about $10.8 million, or 39 percent.

NFC processes bills for payments, computes employee payrolls, collects debts, and generates personnel and accounting information for USDA agencies and staff offices. In fiscal year 1980, NFC processed more than 11.7 million transactions resulting in a payroll of $2.3 billion, about $1.7 billion in other payments, and $134 million in collections.

To make these tasks feasible, NFC has developed a number of computer programs which fall into three categories: the partially operational central accounting system, which will ultimately perform most accounting functions for USDA agencies; the administrative payments and collections systems, which process documents related to agency expenditures and debts owed to the Government; and the payroll and personnel reporting system, which computes the $90 million biweekly payroll and provides various personnel management reports.

Forest Service

The Forest Service uses ADP technology as an integral part of its activities. Increased demands for renewable resources, for the protection of resources, and for management information require extensive use of ADP and supporting technology. The Forest Service is rapidly expanding its use of ADP services. ADP obligations have grown from $5.2 million in 1970 to a forecasted $82.6 million in 1981.

Land management planning, as mandated by recent legislation, will have a great impact on data processing. The Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act of 1976 (16 U.S.C. 1600 et seq.) expanded Forest Service planning responsibilities and ADP needs. The Resources Planning Act requires that the Forest Service assess the Nation's forest, range, and other associated lands' renewable resources program every 5 years. The National Forest Management Act requires the Forest Service to develop a land and resource management plan for each of its forests before 1985. ADP will be required to handle the large amounts of information necessary to create the plans.

Data processing is also used in areas such as inventories, road design, and financial accounting. Planning, budgeting, and administrative activities also use computer applications to provide management data as well as external reports. Word processing and electronic mail will also increasingly require ADP resources.

Agricultural Stabilization and Conservation Service

ASCS is interrelated with the Commodity Credit Corporation, a wholly Government-owned corporation which has no operating personnel of its own. The Commodity Credit Corporation's activities are conducted by ASCS personnel working through ASCS facilities, State and county committees, and other USDA agencies.

The Commodity Credit Corporation was created in 1933 to stabilize, support, and protect farm incomes and prices; to help maintain balanced and adequate supplies of agricultural commodities; and to facilitate the orderly distribution of such commodities. Its programs and activities range from feed, grain, wheat, and cotton programs to commodity support and marketing quota programs.

To support the above programs, ASCS has developed several ADP application systems. For example, the price support loan system was developed to record information on loans made, storage payments, repayments, and forfeitures. Another system is the processed commodity inventory system, which is designed to maintain records of acquisitions and dispositions of processed commodities. Estimated ASCS obligations for ADP totaled about $12 million for fiscal year 1980.

Farmers Home Administration

FmHA has grown from a credit agency for low-income farmers to a major Federal agency providing assistance for agricultural and rural development. In 1979 FmHA was servicing the accounts of about 1.25 million individual and association borrowers with a principal indebtedness of $36 billion.

FmHA's current computer-based accounting and information system processes loan accounting data for programs serving rural Americans. Because of serious deficiencies in this system, FmHA decided in 1974 to begin developing a replacement system, UMIS, to provide better management information. To date FmHA has incurred about $17 million in costs to develop UMIS. In chapter 3 we discuss FmHA's problems in trying to develop a viable information system.

CENTRAL COMPUTER AND TELECOMMUNICATIONS RESOURCES

Data Services, USDA's central ADP office, operates four major computer centers. These are the Fort Collins Computer Center in Colorado, the Kansas City Computer Center and the St. Louis Computer Center in Missouri, and the Washington Computer Center in Washington, D.C. St. Louis is organizationally under the management control of the Kansas City Director. For the last few years, Data Services has been planning to close the St. Louis center and move its operations to Kansas City. This move was planned to occur when FmHA's UMIS project was completed. However, because of delays in completing the project, the status of the St. Louis facility is uncertain.

Before 1978 Data Services also operated the computer center at NFC in New Orleans, Louisiana. During the USDA-wide reorganization in 1977, NFC took control of this computer center and merged it into its operations.

Together, these centers serve all USDA agencies. Annual operating costs are about $20 million. These costs are charged back to the agencies through a billing mechanism based on the amount and type of service rendered.

In addition to its computers, USDA has a sizable investment in data communications networks. Data Services and various agencies operate six different communications networks having equipment valued by USDA at about $1.9 million and incurring annual operating costs of $4.5 million. USDA also employs approximately 1,500 data terminals dispersed nationwide which operate over dial circuits.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our review was made pursuant to the request of the Chairman, House Government Operations Committee. The objective of our

review was to evaluate the effectiveness of the Department's central ADP management and organizational structure in supporting USDA's mission and programs. We accomplished this objective by evaluating how USDA's central management structure ensured that major ADP management functions such as planning, developing software, and maintaining security were adequately performed by USDA agencies. We carried out our work at four USDA computer centers, selected agencies, and the Department's central ADP management office. More details on the objective, scope, and method of our review are presented in chapter 7.

CHAPTER 2

EFFECTIVE IMPLEMENTATION OF THE PAPERWORK REDUCTION ACT WILL FOSTER BETTER INFORMATION RESOURCES MANAGEMENT

The Department's central ADP office has not been providing the planning, control, and direction necessary to ensure the efficient and effective use of USDA's growing investment in computer resources. The central ADP office was established by the Secretary in 1972 to manage USDA's total ADP resources. However, since then this office has been weakened by a major ADP procurement cancellation, reorganization, and an ambiguous mission. The central office, located at a low level in the organization, has been relegated to functioning primarily in advisory, procedural, and coordinating capacities.

The result of this weak management is continuing deficiencies in the management and use of ADP and other information resources. Software projects are incurring cost and time overruns because they are not properly managed. The Department computer centers have had continual problems in releasing obsolete equipment and in maintaining efficient operations and adequate capacity to meet user requirements. The central office has no oversight mechanism to ensure agency compliance with security standards and procedures. Although the importance of an overall ADP plan was recognized as early as 1970, guidelines for preparing such a plan do not yet exist. Under the current organizational structure, accountability for these deficiencies is unclear and dispersed.

We believe that the Paperwork Reduction Act of 1980, if effectively implemented, will materially improve USDA's information resources management (IRM). The act requires USDA to designate a senior official, reporting to the Secretary, with authority and responsibility for ensuring the effective and efficient management of ADP and other information resources. This senior official must not be burdened with duties unrelated to IRM and should be supported with a strong organizational structure. The official will also need to develop an IRM program for USDA setting out the plans, policies, and priorities whereby the Secretary can communicate to the organization the direction it should take in IRM matters. With a strong organizational structure and an IRM program, the senior official can provide the necessary planning, control, direction, and accountability USDA so badly needs.

EXISTING ADP ORGANIZATION DOES NOT PROVIDE ADEQUATE PLANNING, CONTROL, DIRECTION, AND ACCOUNTABILITY

Established in 1972 to manage all USDA data processing resources, the central ADP office's authority has been so weakened by a major ADP procurement cancellation, reorganization, and lack of a clear mission that it now carries out essentially an advisory role. The central office has also received little direction from USDA agencies' top management since no effective forum exists for such direction. Furthermore, accountability for ensuring the efficient and effective use of USDA's ADP resources is unclear and dispersed.

This absence of central direction and control has contributed to many serious deficiencies in how agencies manage and use ADP resources. These deficiencies, dealt with in subsequent chapters of this report, include

--no evaluation or oversight mechanism to ensure efficient and effective use of ADP resources (see chs. 3 through 6),

--failure to take timely corrective action to deal with FmHA's problems with UMIS (see ch. 3),

--large cost and time overruns associated with software projects (see ch. 3),

--lack of consistent, quality service from USDA computer centers (see ch. 4),

--large amounts of obsolete equipment (see ch. 4),

--inefficient use of computer centers (see ch. 4), and

--lack of comprehensive long-range planning (see ch. 6).

The extensive list of our and OIG reports issued since 1975 and summarized in appendixes I and II indicate that USDA's ADP problems have continued for some time.

Importance of central ADP management recognized by USDA in 1970

USDA's recognition that it needed a central ADP management office surfaced in December 1970 when a staff study, prepared to analyze current and future ADP requirements, concluded that USDA's ADP resources were not being used effectively. In particular, the study found that USDA's ADP needs were not well served by the continuing proliferation of single-agency, single-purpose computers. The study identified 43 USDA computer systems in 26 cities and 67 new computers planned for installation by 1975. In most cases these computer centers were managed and operated by and for

individual agencies. The study recommended that the Secretary of Agriculture approve several concepts to avoid duplication and waste of resources, including management of all of USDA's data processing resources by a central office.

These concepts were formally accepted by the Secretary and promulgated in Secretary's Memorandum No. 1775, dated March 30, 1972. The purpose of this memorandum was to strengthen management of ADP resources by establishing a central office to manage USDA's total ADP resources, including the operation of its data processing facilities. The Secretary's memorandum established the Office of Information Systems (changed to Office of Automated Data Systems in January 1974) as a separate office under the Assistant Secretary for Administration.

Based on the broad mandate set out in the Secretary's memorandum, the USDA Administrative Regulations state the central ADP office's mission as follows:

> "Exercise full Department-wide contracting and procurement authority for automatic data processing and data transmission equipment, software, services, maintenance, and related supplies. This authority includes the promulgation of departmental directives regulating the management of contracting and procurement functions related to the above."
>
> * * * * *
>
> "Manage and operate the total USDA data processing program through all stages of the data processing cycle: Advance planning, feasibility, design, equipment selection and acquisition readiness effort, system installation, system impact appraisal, timesharing and service center arrangements, systems monitoring, evaluation, and security.
>
> "Plan, develop, install, and manage departmental data bases and assist in the maintenance of such systems to satisfy agency needs.
>
> "Develop an integrated computer network for use with Department agencies and offices."

Major procurement cancellation weakens confidence in fledgling ADP organization

Shortly after its formation, the central ADP office embarked on a major project to acquire equipment for four USDA computer centers. Due to congressional and our criticism of the project, it was canceled. We believe that the fledgling central ADP office's inability to carry out this large-scale ADP procurement lowered top management's confidence in the office and thus weakened it. The office was unable to recover from the loss in confidence resulting from the procurement's cancellation and

did not establish a strong management role for itself within USDA as envisioned by the Secretary's 1972 memorandum.

In April 1973 USDA requested authority to procure ADP equipment for four centers (with the option to equip a fifth center). At that time the General Services Administration (GSA) was planning to acquire a large-scale computer system for one of its Federal data processing centers so that operations at its centers could be consolidated. GSA's planned procurement involved a data communications network for remote terminal use, but the proposed USDA procurement did not.

Because of the similarity in the procurement objectives of the two agencies and because of the potential savings through quantity discounts, USDA proposed a joint procurement. During negotiations GSA agreed to use USDA's request for proposals for ADP equipment, and USDA agreed to use GSA's request for proposals for the data communications network. In February 1974 GSA released the request for proposals for the joint procurement to industry.

This joint GSA and USDA computer acquisition project was referred to as the Federal Information Network (FEDNET). Our estimates of total costs for USDA's four centers covering the project's 8-year systems life came to $398 million, including $106 million for ADP equipment and software.

In April and May 1974 widespread concern was expressed in the Congress and elsewhere because of implications that FEDNET could be expanded to link all modern computers in the Government and could pose a serious threat to the privacy of all individuals involved in any Government operation or program. Some Members of Congress interpreted the joint procurement as another attempt to establish a national data center, a concept the Congress rejected in 1968 because of the privacy issue. The Congress was also critical because GSA had not kept it fully informed of plans for a project as large as FEDNET.

Due to congressional opposition, the request for proposal was revised in July 1974 to eliminate the data communications network and ADP equipment for the GSA center.

In response to congressional requests made during May 1974, we reviewed USDA's involvement in the FEDNET project. Our report 1/ concluded that USDA had not made the detailed

---

1/"Improved Planning--A Must Before a Department-wide Automatic Data Processing System Is Acquired for the Department of Agriculture" (LCD-75-108, June 3, 1975).

plans or studies that should have preceded procurement. Specifically, USDA did not (1) adequately analyze user requirements, (2) adequately consider security requirements to protect sensitive information, and (3) make economic studies to evaluate the project's benefits and the costs of alternative designs. We recommended that the proposed procurement be canceled and analyses be made to select the best alternative for meeting USDA requirements.

Subsequently, USDA canceled the FEDNET procurement. However, rather than strengthening its management, performing the necessary analyses, and developing an appropriate procurement strategy, the central ADP office reacted by developing a crisis approach to meeting USDA's immediate data processing needs. This approach led to an ill-conceived plan for a series of interim upgrades (mostly sole-source) at the computer centers. This approach resulted in congressional concerns about USDA's ADP management, and more congressional requests for us to review USDA's ADP procurements. Our reviews resulted in a series of reports (see app. I) issued during 1976 and 1977 disclosing inadequate planning, poor justifications, deficient security, and an inability to accurately determine user requirements. These weaknesses were similar to those identified in the early 1970s by USDA, during 1975 and 1976 in our FEDNET review, and during 1980 in this report. The result of years of weak central ADP management is evident in an October 1980 internal Data Services discussion paper which states, "Confidence in ADP solutions is low. The automation failures, missed schedules, and cost overruns have caused many program managers to mistrust ADP project estimates."

Secretary's 1977 reorganization lowers central ADP office

On October 5, 1977, the Secretary of Agriculture issued Secretary's Memorandum No. 1927 ordering consolidations and mergers of functions and units in seven departmental areas. The single criterion given by the Secretary as the basis for his reorganization was that agencies and offices which have similar objectives or missions should, to the extent practical, be consolidated. The Secretary believed this reorganization would provide opportunities for improved management of departmental programs and policies by focusing responsibility for similar functions in a similar number of units and administrators.

In his October 1977 memorandum, the Secretary directed that the three administrative support offices (Office of Automated Data Systems, Office of Operations, and Office of Finance) under the Assistant Secretary for Administration be combined into a new Office of Operations and Finance (O&F). Although this brought together related administrative service functions, it downgraded the central ADP office in the organizational structure. Rather than reporting directly to the Assistant Secretary for Administration, the central ADP office now reports to the Director, O&F.

Later, the Office of Automated Data Systems was renamed the Office of Data Services. (See O&F chart on p. 5.)

Three former officials of the central ADP office, including two officials who served as head and acting head, told us that this merger went in the opposite direction of the prevailing trend in private industry which was to elevate information-related functions. They said more and more companies are creating a "Vice-President for Information Resources Management." All three cited this USDA reorganization as a serious setback to improving ADP management.

Mission and authority of central ADP office is unclear

Generally, the mandate for strong central ADP management given by the Secretary's 1972 memorandum and set out in USDA's Administrative Regulations has not been widely accepted. The central ADP office has allowed USDA agencies to manage ADP projects with minimal departmental involvement. However, on occasion, the central office has taken a strong stand contrary to the wishes of USDA agencies.

The role currently followed by the central ADP office is that of a staff office which seeks to carry out its objectives through persuasion rather than any authority or power that may be inherent in its position. From this view flows its reluctance to "enforce" its thinking on USDA agencies. The central office does not exercise any regular, formal oversight function to ensure adequate ADP management by agencies. Rather, it sees itself in an advisory role to the agencies and working in partnership with them in a cooperative spirit to promote effective use of USDA's ADP resources. Finally, the central office coordinates rather than directs the ADP activities of USDA agencies.

We believe uncertainty about its mission and authority is partly responsible for the central ADP office's reluctance to vigorously carry out the strong management role originally envisioned. Although the Secretary's 1972 memorandum may have provided a clear mandate when issued, since then it has been subjected to varying interpretations creating confusion about the mission and authority of the central ADP office.

A major reason for establishing the central ADP office was to consolidate and operate USDA's large computer centers. However, a former Deputy Secretary weakened this responsibility by permitting exceptions. During 1977 requests were made by ASCS and NFC to obtain control of the Kansas City and New Orleans Computer Centers, which were operated by the central ADP office. In October 1977 the Deputy Secretary denied ASCS' request but approved NFC's. The Deputy Secretary emphasized his support for consolidation and centralization of USDA's computer centers. However, the Deputy Secretary also said that in the future, if

any agency can fully justify managing its own computer and has submitted a justification that he can support, he will help that agency obtain its own computer.

Changing technology and new management concepts have added to the confusion. USDA's concern in the early 1970s was how best to manage USDA's large computer centers and data bases. The need for centralized operations and control of ADP technology was evident at that time. However, since then important changes have been taking place in information technology and management. Hardware costs have been falling dramatically while software costs have been increasing. This, along with advances in telecommunications and computer hardware, has hastened the concept of placing more computer capability in the hands of users who may be located in field offices away from agency headquarters. This concept is often referred to as distributed processing. For several years, USDA's central ADP office was opposed to this concept because it appeared to conflict with its mission to promote the use of large, centralized computer centers. This opposition created problems for the Forest Service, which has wanted to implement distributed processing since at least 1975. It was only during the last 2 years that the central ADP office began to work in concert with the Forest Service on distributing computer processing capability to its field offices.

Although the new technology indicates that operations will become more and more decentralized, we believe it will require stronger centralized direction and control. Only with strong centralized management will an organization be able to ensure that there is a solid framework of plans, policies, standards, and guidelines to guard against waste and inefficient use of information technology left in the hands of often inexperienced users.

Finally, in recent years confusion has been mounting regarding the authority of USDA's central ADP office over agency information activities--in particular, authority over large management information systems under development by agencies. The central ADP office does not review or monitor agency systems development projects at specified intervals. It reviews such projects only if they go over prescribed dollar thresholds and involve procurement actions. The problems created by the central ADP office's unclear authority are evident in its inability to take corrective action to help prevent the failure of FmHA's UMIS project as noted in the House Committee on Government Operations report quoted in chapter 1.

Accountability for ADP management is dispersed

An important question that should be asked concerning the ADP deficiencies at USDA is, "Who is accountable to the Secretary?" At the time of our review, there was no single official the Secretary could hold fully accountable for overall management

of computer and information resources in his organization. In practice, responsibilities for data processing are not centralized; they are shared throughout USDA. Responsibility for ADP management is divided among the agencies and three levels within the Department.

Generally, agencies are responsible for the effective use and management of ADP within their organizations, including the responsibility to assess their program requirements. Data Services has interpreted this responsibility to mean that agencies have full authority to fund and develop their own automated information systems subject only to certain standards and security requirements prescribed by the central ADP office. Agencies do need technical approval from the central office if a proposed system exceeds certain dollar thresholds and requires procurement action. However, if an agency develops a system with in-house resources, technical approval is not required.

Responsibility for central ADP management is shared by the Assistant Secretary for Administration, the O&F Director, and the head of Data Services.

Under the responsibilities as delegated in the USDA Administrative Regulations, the Director, O&F, has the authority and responsibility over the entire area of ADP and telecommunications under delegations of authority received from the Assistant Secretary for Administration. The Director reports to the Assistant Secretary for Administration. Generally, the highest level within USDA that approves ADP/telecommunications matters is that of the Director, O&F. Major changes in policy are brought to the attention of the Assistant Secretary for Administration, the Deputy Secretary, and, if need be, to the Secretary for consideration.

The day-by-day responsibility for overseeing ADP and telecommunications within USDA is the responsibility of the Deputy Director, Data Services. (This official is a deputy to the Director of the Office of Operations and Finance and is the head of Data Services.) This office reports to the Director of O&F. The Deputy Director, Data Services, is considered the top ADP operating official in USDA.

No top-level forum exists to address USDA-wide ADP matters

Any resource that is critical to effectively accomplishing an organization's objectives requires the attention of top management. A steering committee is an accepted way for top management to provide leadership and direction and to assure efficient and

effective use of information resources. Our reports 1/ have repeatedly stressed the need for and importance of a steering committee.

USDA does not have an effective top-level forum to address USDA-wide ADP matters. A Management Council of Department and agency administrators exists but only intermittently discusses ADP matters. An ADP Policy Advisory Board formed several years ago has floundered and rarely meets. A lower level group of senior ADP officials meets regularly but serves as a coordinating group and vehicle for the exchange of information.

The objectives of the Management Council are, first, to better acquaint the chief administrative officers in the agencies with their counterparts and activities carried out by these peers. Secondly, the Management Council serves as a sounding board for the management initiatives, improvement ideas, and suggestions of any of its members, principally the Assistant Secretary for Administration. Thirdly, the Management Council acts as a coordinating body to deal with management problems throughout USDA.

The Management Council usually meets every month. It does not routinely discuss or provide policy guidance on ADP/telecommunications matters, although matters of ADP policy do come up for discussion during its meetings. The Director, O&F, and the Deputy Director, Data Services, are members of the Council.

In House Report 94-1224, dated June 8, 1976, the Agriculture Subcommittee of the House Committee on Appropriations indicated that it expected an ADP Policy Advisory Board to be established within USDA, such a Board to consist in part of the Administrators or their designees from each of the larger USDA agencies, for the purpose of allowing agencies to participate more fully in the establishment of departmental ADP policy. Developments within as well as outside the Department indicated the need for more direct involvement of senior agency management officials in the Department's efforts to more effectively manage ADP resources.

Even though a congressional committee recommended the establishment of an ADP Advisory Board and the need for it was

---

1/"National Bureau of Standards Needs Better Management of Its Computer Resources To Improve Program Effectiveness" (CED-79-39, Apr. 17, 1979); "Inadequacies in Data Processing Planning in the Department of the Interior" (FGMSD-78-41, June 23, 1978); "Inadequacies in Data Processing Planning in the Department of Commerce" (FGMSD-78-27, May 1, 1978); "Farmers Home Administration Needs To Better Plan, Direct, Develop, and Control Its Computer-Based Unified Management Information System" (CED-78-68, Feb. 27, 1978); and "Stronger Management of EPA's Information Resources Is Critical to Meeting Program Needs" (CED-80-18, Mar. 10, 1980).

recognized by USDA ADP officials, the Board has not developed into an effective forum. The ADP Advisory Board, as originally constituted, had as its objective to provide policy guidance based on the deliberations of its members in areas of ADP/telecommunications. The ADP Advisory Board was disbanded in 1977 after about 1 year due to the inability of its supporters to maintain interest at the level of the assistant secretaries, agency administrators, and the deputy administrators for management who constituted the membership. It has been reestablished by USDA Administrative Regulations, but it has met only twice since 1977. The regulations state that the Board will meet at least quarterly.

The ADP Resource Exchange Program was established in 1974 by the senior ADP managers independent of the departmental ADP staff office. The initial purpose of the group was to provide a forum for joint dissent regarding ADP policies and the quality of ADP services provided by the departmental computer centers. Subsequently, the group revised its charter and bylaws. Currently, the Resource Exchange Program's basic purpose is to serve as an information exchange and as a vehicle for regular meetings with Data Services management.

BESIDES ADP, USDA HAS HAD OTHER PROBLEMS WITH MANAGING INFORMATION RESOURCES

Besides the ADP deficiencies noted on page 11, we have issued reports identifying other non-ADP problems USDA has had with managing information resources. These problems dealt with records management and paperwork management.

Records management includes various managerial activities related to records creation, maintenance and use, and disposition. There are nine traditional records management functions: correspondence, directives, forms, reports, copy, mail, files, micrographics, and disposition. Records management is an integral part of effective organizational administration.

In our report "Federal Records Management: A History of Neglect" (PLRD-81-2, Feb. 24, 1981), we stated that serious deficiencies with records management have existed for years among Federal Government agencies. When we visited the Department of Agriculture during that review, the departmental directives system was in disarray, according to a departmental memorandum. The memorandum also stated that many directives reflected out-of-date and inadequate policies and procedures. The system, which was developed in the mid-1940s, required modernization. A 1975 inspection report on USDA, prepared by the National Archives and Records Service, recommended that USDA develop and implement, by directive, USDA-wide programs for managing correspondence, directives, mail, files maintenance, and records disposition. We noted in our report that a February 1980 USDA contract to improve the directives system was the first step toward complying with the 1975 recommendations.

Paperwork management deals with controlling the paperwork burden that the Federal Government imposes on the public by subjecting proposed reporting requirements to a clearance review and approval process. One objective of the process is to protect the public from unneeded, redundant, or poorly conceived information required by the Federal Government.

In our report "Department of Agriculture: Actions Needed To Enhance Paperwork Management and Reduce Burden" (GGD-80-14, Mar. 10, 1980), we concluded that USDA's paperwork management program needed improvement. Shortcomings in the program allowed (1) the collection of unused information and (2) the use of reporting requirements which were not approved. Over 1,100 unapproved reporting requirements were in use. In an earlier report, "Protecting the Public from Unnecessary Federal Paperwork: Does the Control Process Work?" (GGD-79-70, Sept. 24, 1979), we disclosed that the reports clearance process of USDA and two other departments lacked strong controls at all levels of review. USDA did not have evaluation mechanisms to assure that the process was working and seldom conducted postaudits of reporting requirements, even though such reviews might have been cost effective.

EFFECTIVE IMPLEMENTATION OF THE PAPERWORK REDUCTION ACT CAN REMEDY USDA's ADP DEFICIENCIES

The Paperwork Reduction Act of 1980 can remedy many of USDA's ADP deficiencies if it is effectively implemented in an aggressive and assertive manner. The act requires each Federal agency to designate a "senior official" responsible for carrying out information activities including ADP in an efficient, effective, and economical manner. We believe that if this senior official and the supporting management structure are effectively placed and organized and a meaningful management program is developed, USDA should materially improve its planning, control, direction, and accountability for information resources management.

The Paperwork Reduction Act embodies IRM concept

In the last few years, an information resources management concept has emerged as a focus of managing information activities. Although lacking a concise or universal definition, the IRM concept has become a framework for planning more responsive and coordinated information management organization structures throughout Government and the private sector. In brief, IRM is viewed as an integration of management responsibilities for the control of information-related activities and related processes. It includes the planning and management of information collection, use, and dissemination as well as the management of information technologies.

Historically, information management has been a fragmented activity shared among the traditionally independent elements of an organization. Many of the critical data-handling activities (payroll, invoices, payments, inventories, etc.) of an organization have been located in the administrative or financial management offices. Automation of these activities has resulted in placing management responsibilities for computers and information systems in the office of an organization's administrator or comptroller. Since information-related programs also may be administered by other elements in an organization, in many instances a dispersed information management structure has resulted. For example, activities such as information and library services, statistical functions, information programs, and associated activities (policy, reports, management, procurement, and communications) may not be centrally managed. Often, responsibility for managing these activities and services is shared, and in some instances the jurisdictional responsibility may not be clear. As a result of this fragmented approach, information resources sometimes have been poorly managed and inappropriately used.

The current rationale for comprehensive management of information-related activities is that these activities contribute to an organization's effectiveness. According to the general IRM concept, the IRM office within an organization should provide a central focus for all those information activities that support and serve the organization. Also, this office should reflect the organization's specific directions and goals and be consistent with good management practices. The objectives and goals of the IRM office should be formulated to provide a cohesive management framework consistent with organization requirements and values. The IRM policies and procedures should provide a foundation for developing the information architecture and relevant programs required by the organization.

The Congress has had a continuing interest in the management of information and associated information policy, especially Federal information and ADP management. Acquisition of ADP and information systems and equipment; use, collection, and dissemination of information; and development of information-related standards have been of particular concern. The Congress also has encouraged more effective policies to limit information disclosures, preserve personal privacy, reduce paperwork burden, and improve information management in Federal programs.

These congressional concerns about how the Federal Government manages its information resources culminated in the passage of the Paperwork Reduction Act. The act requires uniform and consistent information policies and practices and strengthens and centralizes certain Federal information management activities. A function of both the act and the concept is the focus on centralization of information-related activities management. In the act the management of information activities is focused within the Office

of Management and Budget (OMB) by creating a new office structure and in the individual Federal agencies by designation of a "senior official."

The act establishes an Office of Information and Regulatory Affairs in OMB with certain responsibilities, including oversight of Federal agencies, to ensure that information management activities are carried out efficiently and effectively. The act sets out these six categories of information management activities: paperwork control, statistical policy and coordination, records management, privacy, ADP and telecommunications, and agency rulemaking that involves a collection of information requirements. In addressing ADP and telecommunications, the act directs that OMB establish polices, principles, standards, and guidelines; oversee the establishment of standards; and monitor compliance with sections 110 and 111 of the Federal Property and Administrative Services Act of 1949 (Brooks Act). As required by the Paperwork Reduction Act, OMB would provide advice and guidance on the acquisition and use of ADP and telecommunications equipment and coordinate, through budget reviews, agency proposals for relevant information-processing equipment. The act also directs that OMB promote effective use of information technology, improve the use and dissemination of data, and initiate and revise proposals for changes in legislation, regulations, and agency procedures related to Federal use of information technology.

In addition, the act provides that each agency head shall designate by July 1, 1981, a senior official who will be responsible for ensuring agency compliance with Federal information policies, principles, standards, and guidelines. The official will also be responsible for ensuring that the agency carries out its information management activities efficiently, effectively, and economically. The official will also be required to periodically review the agency's information management activities, including the "planning, budgeting, organizing, directing, training, promoting, controlling, and other managerial activities involving the collection, use and dissemination of information."

How can the Paperwork Reduction Act improve USDA's information resources management?

We believe that effective implementation of the Paperwork Reduction Act can improve USDA's planning, control, direction, and accountability for information resources management.

First, and most importantly, it will assign accountability by establishing a single individual in USDA with a clear mandate to carry out USDA's responsibilities under the act.

Second, the act emphasizes the importance of information resources management by requiring that the senior official report to the head of the agency.

Third, the act emphasizes the need for top-level agency oversight and control to ensure that an agency efficiently, effectively, and economically uses its information resources and complies with information policies, principles, standards, and guidelines prescribed by OMB. Specifically, the act states that each agency shall

> "* * * periodically review its information management activities including planning, budgeting, organizing, directing, training, promoting, controlling and other managerial activities involving the collection, use and dissemination of information."

Fourth, if USDA is to effectively carry out its responsibilities under the act, it will need a good planning process. Good planning is a prerequisite to efficient and effective operations.

And fifth, the act provides clear direction by giving the senior official responsibility for all information activities through the entire process of collection, dissemination, and use. Both the House and Senate reports state that the senior official has approval authority over the agency's information functions.

The Paperwork Reduction Act provides guidance on organizational structure

The Paperwork Reduction Act does not prescribe any specific organizational structure for Federal agencies in carrying out their responsibilities under the act. However, the act, along with its legislative history and implementing guidance being prepared by OMB, does provide guidance to Federal agencies.

The act states that each agency (defined as any executive department) shall designate a "senior official" who will "report directly" to the "agency head." Also, the act sets out certain responsibilities for managing information resources that involve compliance and accountability, indicating that the senior official will need to exert substantial influence over the use of information resources and will need significant authority.

In House Report No. 96-835 accompanying the bill (H.R. 6410), the following statements on legislative intent were included:

> "It is also expected that certain restructuring of activities may be required within the agencies. The Committee expects that each agency will reorganize, to the extent necessary, so that the counterpart activities within the agency to those assigned to the OMB Office of Federal Information Policy [later amended to Office of Information and Regulatory Affairs] will report directly to the senior official designated by the agency head. This realignment should provide for greater coordination among the agency's information

activities as well as greater visibility within the agency."

* * * * *

"Under this legislation, the responsibility and accountability for the agency's information management activities is in that senior official designated by, and reporting directly to, the agency head under Section 3506(b) of proposed new chapter 35, Title 44, United States Code. A proposed structure for an agency will comply with the intent of H.R. 6410 provided that (a) the agency's information functions, which relate to the OMB Director's functions listed in Section 3504 (a), are under the jurisdiction of the designated agency official and (b) the designated official has final approval authority over the agency's information functions. Subcomponents may be created under the designated agency official as necessary to reflect the agency's operating needs, as long as such subcomponents shall report directly to, and be under the direction of, such official. This recognizes that one structure will not be appropriate for all agencies."

Similar language is included in the Senate report 1/ accompanying S. 1411, the Senate version of the bill.

The House report also includes language that constituent agencies in a Government department will be expected to establish central information management units, as follows:

"The appropriate structure under H.R. 6410 is somewhat different in the case of a Government department having constituent agencies, such as the Department of Defense. The Committee expects that each constituent agency will establish a central information management unit, subject to the review and approval of the department-level unit headed by the designated senior official. The basic reason for this organization is that a department has the responsibility to consider its mission in a department-wide sense, whereas a constituent agency will generally consider only its own mission. In some cases, an individual action may raise a conflict between a constituent agency and its department. Consistent with the objectives of this legislation and within statutory limits, the constituent agency must conform its needs and interests to those of the department."

1/Senate Report No. 96-930 (96th Cong., 2d session, Sept. 8, 1980).

OMB prepared draft guidance, as of March 1981, to tell agencies how to designate the senior official. It stated:

> "While the specific organizational placement and structure shall be decided by the agency head, OMB expects that the designated senior official will have a substantial, personal, and daily involvement in the management of the agency's information resources."

In addition, the draft guidance recommended that responsibilities beyond those stated in the act should be assigned to the senior official only if the additional functions do not interfere with the performance of the authorities and responsibilities required by the act. Finally, OMB recommends that the senior official not be responsible for operating agency computer facilities or managing an information center. OMB's logic behind this recommendation is that while the senior official has a responsibility to ensure that information resources are managed effectively, efficiently, and economically, day-to-day operational responsibility for collecting, maintaining, and disseminating information should remain with program managers.

How should USDA implement the Paperwork Reduction Act?

Based on implementing guidance contained in the act and its legislative history, the draft OMB guidance, and our review of USDA's ADP management, we believe effective implementation of the Paperwork Reduction Act at USDA would involve (1) designating as the senior official a high-ranking official, other than the Assistant Secretary for Administration, with full-time responsibility for IRM matters, (2) establishing a separate, independent office, (3) developing and implementing an IRM program, (4) establishing a top-level steering committee or similar group to advise the senior official on policy matters, and (5) establishing central management units in each USDA agency modeled after the senior official's office.

Based on our discussions with various Government officials, it appears that several departments will designate the Assistant Secretary for Administration as the senior official since this person already has responsibility for most of the functions in the act. While this may be appropriate in some departments, we believe it is vitally important at USDA to remove IRM policy and oversight responsibilities from under the Assistant Secretary for Administration. USDA is a huge, sprawling organization made up of some 30 diverse agencies and offices with over 100,000 employees and thousands of field offices. It is also an information-intensive organization which could not carry out its mission without information and the supporting resources and technology. A separate, high-level office whose principal responsibility is IRM is justified based on the critical importance of information to

USDA. As shown in the organization chart on page 4, the Assistant Secretary for Administration has important financial, legal, personnel, and other administrative responsibilities. We also believe designating the Assistant Secretary for Administration as USDA's senior official does not comply with the criteria in OMB's draft guidance to agencies on implementing the Paperwork Reduction Act. Given the size and diversity of USDA, we believe the best alternative is to select someone whose sole responsibility is IRM. This would exclude the Assistant Secretary for Administration.

The senior official will need to be a high-ranking official who can devote adequate and continuous attention to carrying out the responsibilities under the act and who can oversee the IRM activities of USDA's largely autonomous agencies. It was evident, based on our discussions with USDA agency ADP officials, that they have not fully recognized the need for or desirability of having a strong central office established with responsibility and authority for information resources management. Generally, agency personnel feel that a strong central office will undercut agency authority. At the same time, they also pointed out that assistant and under secretaries responsible for USDA's programs play a powerful role in the organization and have significant influence with the Secretary.

There will be times when the senior IRM official's views will conflict with the views held by USDA's agency program managers. The outcome of these conflicts could have serious consequences given the critical importance of IRM policy. In our opinion, unless USDA's senior official is on the same level as the program assistant secretaries, IRM matters will not receive the same consideration as program requirements.

Because the act intended an agency's information activities to be managed as an integrated process and for subcomponents to be under the senior official's direction, we believe a separate office is necessary. USDA should also establish in each agency a central information management unit as suggested in the House report on the Paperwork Reduction Act, subject to the review and approval of the senior official. These units would be modeled after the senior official's office.

The senior official will also need to develop an IRM program so that responsibilities required by the act can be carried out systematically in a logical, planned manner. An IRM program would include policies, standards, a comprehensive long-range plan, goals and measurable objectives, and a management system for evaluating performance. Agency top management must participate in developing and implementing USDA's IRM program. A steering committee or similar mechanism of top-level agency representatives would help advise the senior official on policy issues. However, it must be understood that the senior official is the one responsible for USDA's IRM activities.

Because of potential conflict between operations and the senior official's oversight responsibility, the senior official may not want to include operational functions, such as the Department's computer centers, in his office. However, the decision on where in USDA's organization to place these information-related operational functions should be made by the senior official.

In April 1981 while we were finalizing the report we were informed that USDA had designated the Secretary's Executive Assistant as the senior official under the Paperwork Reduction Act. We were told by the Executive Assistant that additional questions on implementing the act were under discussion and no other decisions had been made.

CONCLUSIONS

Since 1975 we and USDA's OIG have reported on ADP and other information resources management deficiencies existing in USDA. In our current review we found that these continuing ADP deficiencies are caused by weak central management. Adequate planning, control, direction, and accountability are critical elements missing from USDA's ADP management process and have been reported as missing from other IRM functions.

We believe that the recently passed Paperwork Reduction Act can materially improve USDA's information resources management, including ADP. During processing of our report the Secretary designated his Executive Assistant as the senior official. We believe this is a positive step because it places IRM responsibilities outside the office of the Assistant Secretary for Administration and separates these responsibilities from other activities, such as finance, accounting, and personnel. However, there is much more to be done for USDA to effectively implement the act. The "senior IRM official" should not be just a title. He will have to devote substantial attention to IRM matters. He will need a strong management structure and a meaningful IRM program to carry out his responsibilities under the act. In subsequent chapters, we have directed our recommendations to specific activities--management of software projects, computer center operations, security, and planning--that should be part of the senior official's responsibility and authority and that should be included as a part of USDA's IRM program.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary of Agriculture

--issue a memorandum to agency heads describing the responsibilities and authority of the senior official with specific attention to the senior official's authority over agencies' IRM activities;

--designate USDA's senior official an assistant secretary or equivalent level;

--establish a separate, central IRM office headed by the senior official;

--include as part of the IRM office such IRM-related subcomponents as deemed necessary for the senior official to carry out his responsibilities;

--establish a top-level USDA steering committee or similar group of agency representatives to provide the senior official with advice and recommendations on policy and other significant IRM matters;

--issue a memorandum to agency heads stressing the need for involving top management in information resources management and in the activities of the USDA steering committee;

--direct the senior official in carrying out his information activities to develop and implement a USDA-wide IRM program; and

--direct USDA agencies and offices to establish central information management units subject to the senior official's review and approval.

CHAPTER 3

MORE DEPARTMENTAL GUIDANCE AND STRONGER CONTROL COULD IMPROVE SOFTWARE MANAGEMENT

USDA's senior official designated under the Paperwork Reduction Act should ensure that agencies improve the control and planning of their software development, conversion, and maintenance activites. In carrying out these activities, agencies frequently are not following accepted management principles, such as conducting user requirements analyses, preparing cost/benefit studies and comprehensive project plans, and assigning full-time project managers. These management weaknesses have contributed heavily to such undesirable conditions as

--delays and cost overruns in software development and conversion projects totaling millions of dollars at three USDA agencies;

--continued use of obsolete, maintenance-intensive computers alongside underutilized modern equipment; and

--ineffective management of USDA's software maintenance activities.

The objective of investing in data processing is to develop automated information systems and applications software that are cost effective and meet user needs and to do so within cost and time limitations. Since requirements change over time, applications not completed on schedule may not meet user needs. Furthermore, cost and schedule overruns can diminish, and even eliminate, the cost effectiveness of an application.

USDA's senior official must be given a strong oversight role to provide effective guidance for agency software activities and to ensure the effective and efficient use of the Department's information resources.

THE IMPORTANCE OF SOFTWARE

In the early days of computers, the price of the equipment (hardware) was the major ADP cost. The computer programs (software), which make the equipment operate, cost relatively little. However, software now costs considerably more than hardware, which has steadily declined in price because of technological advances.

USDA does not accumulate cost data on software activities as a separate item. However, the Assistant to the Director for Technology and Development, Office of Operations and Finance, estimates that approximately two-thirds of USDA's ADP funds

are devoted to software applications development and maintenance. This is probably a conservative estimate. We noted in our recent report, "Wider Use of Better Computer Software Technology Can Improve Management Control and Reduce Costs" (FGMSD-80-38, Apr. 29, 1980), that recent studies predict that by 1985 over 90 percent of the cost of ADP will be attributable to software. USDA's total estimated ADP budget for fiscal year 1981 is $158 million. Using the two-thirds ratio of software to total ADP costs, we estimate USDA's software costs during fiscal year 1981 at $105 million.

The effective management of software is important because of its high cost, its critical role in managing USDA's billions of dollars of assets, and its support of agency programs. The head of Data Services believes that managing software will be USDA's biggest ADP challenge in the 1980s.

Software is generally grouped into systems software, utility software, and applications software.

Systems software automates the control and operation of the computer and auxiliary equipment. It controls the running of applications and utilities (see below), controls the allocation of computer resources, and reports on the resources used. Systems software is usually supplied by the computer vendor but may be obtained from other suppliers.

Utility software aids the tasks of computer programers and others who work with the computer. It includes language translators and stored routines for very common tasks such as sorting data. (Language translators are compilers and interpreters which transform the statements of programing languages written by humans into internal machine codes which directly control computers.) Utility software may be supplied by the hardware vendor or independent software firms, or written by the user's employees.

Applications software automates the tasks of end users. USDA's applications software systems are directed toward supporting agency mission functions, such as managing loan portfolios, managing grain and commodity inventories, and maintaining data on agricultural producers' allotments, quotas, plantings, and marketings.

Applications software systems have life cycles which can be divided into a development phase and an operational or production phase. The development phase consists of defining the users' requirements, designing the system and computer programs, programing, and testing. The operational phase begins when the applications software produces its first user output; this phase generally includes maintenance and conversion.

OUR PAST REPORTS PROVIDE SOLUTIONS TO GOVERNMENT-WIDE MANAGEMENT PROBLEMS IN SOFTWARE DEVELOPMENT

For over 12 years we have reported on the problems associated with developing software application systems in the Federal Government. About $300 million in waste was identified in these development efforts. This waste of money and effort could have been mitigated through adherence to the following generally accepted software management principles:

--Development of comprehensive project plans that address major aspects of the system and tie into other agency software plans.

--Involvement by top management in large, complex software development efforts.

--Participation by the system users throughout the development process.

--Assignment of project managers as the central point of authority for most major software development efforts.

--Preparation of cost estimates and economic analyses.

--Establishment of effective procedures to compare a system's progress with the approved cost, schedule, and performance estimates.

--Enforcement of established procedures for approving either new design efforts or major enhancements and modifications to existing systems.

USDA SOFTWARE MANAGEMENT RESPONSIBILITIES ARE DIVIDED

Individual USDA agencies are responsible for planning, justifying, managing, controlling, and documenting their applications software projects in accordance with Federal and Department information-processing standards, procedures, and guidelines. Agencies are expected to base their decision to develop a new application on an evaluation of a well-documented plan that considers economics, benefits, priorities, and technical feasibility.

According to the Department's Administrative Regulations, Data Services is responsible for performing the following software management functions: (1) act as technical consultant to agencies in defining ADP requirements, (2) guide agencies in developing applications software systems, (3) review planned and operational systems in terms of technical feasibility, cost effectiveness, and consistency with overall Department plans, and (4) maintain awareness of current and planned systems.

Currently, Data Services has no authority over agency in-house development efforts; however, software development efforts that involve ADP/telecommunications procurements are subject to a technical approval process by Data Services when costs rise above designated dollar thresholds. Otherwise, the agencies are not required to receive the central office's technical approval for in-house software development projects. Data Services, however, is responsible for providing guidance to agencies and staff offices for developing application software systems.

As we discussed in chapter 2, the authority of Data Services over agency software projects is unclear. Data Services does not systematically review agencies' planned software projects, monitor the projects, or evaluate the projects after they are operational. As a result, the Department does not have adequate knowledge of the agencies' costly software efforts.

Based on the extensive delays and large cost overruns some agencies have experienced in recent software efforts, we believe the senior official designated under the Paperwork Reduction Act needs to perform a strong oversight role over agencies' software projects. For example, if Data Services had adequately monitored FmHA's UMIS project, millions of dollars of wasted effort might have been prevented.

AGENCIES HAVE NOT EXERCISED GOOD CONTROL OVER INTERNAL SOFTWARE APPLICATION PROJECTS

Agencies' control over software efforts have been generally fragmented and inadequate. USDA agencies' software development efforts frequently have not been supported by adequate user requirement analyses, project plans, and strong project managers. We found they often did not follow good management principles in planning, conducting adequate user requirements analyses, and assigning project managers, resulting in

- --lengthy delays in project completion and significant cost overruns;
- --prolonged operation of obsolete and inefficient processes and applications systems which are used to manage billions of dollars of assets; and
- --underutilization of modern in-place computers accompanied by prolonged and costly operation of redundant, obsolete computer systems.

We found examples of problems in developing or redesigning applications software systems at the Farmers Home Administration, the Agricultural Stabilization and Conservation Service, and the National Finance Center.

Farmers Home Administration

Probably no software development project better demonstrates the need to follow good software management principles than FmHA's Unified Management Information System. In our 1980 report 1/ we concluded that the UMIS project is experiencing extensive delays that could exceed 7 years and cost overruns that could exceed $25 million. Details on how our cost estimates were calculated are included in our 1980 report. It should be pointed out that this estimate, like most estimates in this chapter, had to be developed by us because generally USDA and the agencies we reviewed did not have good cost data on software projects.

FmHA began developing UMIS in 1974 to replace its present accounting and information system. FmHA determined that the present system was obsolete and not responsive to management's information needs. The primary objectives of UMIS were to provide responsive, timely, and useful management information to all levels of management in order to improve service to rural Americans seeking financial assistance. These objectives have not been met.

We have issued two reports (CED-78-68 and CED-80-67, summarized in app. I) concerning FmHA's problems in developing UMIS. The reports showed that in developing UMIS, FmHA did not properly design, document, or manage the project. As a result, (1) UMIS' projected implementation date is 5 to 7 years later than planned, (2) $17 million and 6 years of effort virtually have been wasted, (3) UMIS' total development costs could reach $42 million, (4) the operational costs of UMIS, as designed, will be excessive, and (5) the system may not meet the basic needs for which it is being developed.

Since FmHA expected UMIS implementation by a specified date, it relaxed maintenance on its present information and accounting system. As a result, the system contains many serious deficiencies. For example, it does not provide adequate and timely data for sound cash management decisions. This is especially serious considering that the system supports the management of FmHA's multibillion dollar loan portfolio.

Since FmHA did not conduct an adequate information requirements analysis, it had no assurance that if UMIS became operational, it would provide needed information or be cost effective. Also, top management was not adequately involved in making critical decisions required throughout the design and development

---

1/"Farmers Home Administration's ADP Development Project--Current Status and Unresolved Problems" (CED-80-67, Feb. 19, 1980).

phases. Finally, the agency did not assign a full-time project manager to keep the project on track. Consequently, the project continued for 6 years without the benefit of effective management controls or accountability that are prerequisites for successful software development efforts, especially for a project of UMIS' size and complexity.

Because of the serious problems FmHA was experiencing in developing UMIS, the Department on December 17, 1979, withdrew FmHA's approval authority for this project. A USDA task force was then established to review the technical, accounting, and user information requirements as well as the organizational and managerial needs for the project's success. In addition, a special study of UMIS was ordered by the new Secretary in early 1981. A final decision has yet to be made regarding actions to correct UMIS management problems.

Agricultural Stabilization and Conservation Service

The requirement to follow accepted management principles is also important for relatively small software development efforts. In 1978 ASCS developed the peanut sales and allotment system to meet the requirements of the Food and Agriculture Act of 1977 which substantially changed the price support and marketing quota programs for the 1978 and subsequent crops of peanuts. ASCS estimated the system's development cost at $133,000 and the annual operating costs at $130,000.

As with FmHA, ASCS did not conduct an adequate requirements analysis, assign a full-time project manager, or monitor and track the development costs. The absence of these essential management practices contributed to actual development costs reaching $332,000 and the first year's operational cost exceeding $681,000, or more than five times the amount estimated. (These cost estimates were provided by ASCS.) Unlike UMIS, the peanut system is operational and is generally meeting user requirements. This, however, has required extensive and costly modifications over a 2-year period after the system was implemented because of inadequate user requirements analyses.

ASCS program divisions spent about 5 months determining their information requirements before deciding to develop the peanut system. Even so, this did not result in a reasonable definition of the divisions' requirements. During system development, numerous modifications were required since divisions were redefining their requirements. In addition, after implementation, the system required significant and costly modifications because of the divisions' earlier inaccurate requirements analyses.

National Finance Center

In our review we examined two large software development projects undertaken by NFC--the redesign of USDA's payroll/

personnel system and the development of USDA's central accounting system. In each case we found inadequate project plans and controls which clearly contributed to lengthy schedule delays and millions of dollars in cost overruns.

Payroll/personnel system

NFC's redesign and reprograming of the USDA payroll/personnel system will not be completed until at least 3-1/2 years later than planned at a cost overrun of more than $3.3 million. The lack of consistent planning, coupled with project managers who were not given sufficient authority, contributed heavily to project delays and cost overruns. In addition, USDA will be relying on obsolete, high-risk, and inefficient computers to process the biweekly payroll for 100,000-plus USDA employees.

NFC officials decided to redesign the USDA payroll/personnel system, rather than only convert it, to take advantage of technical advances which would be available from new equipment being procured. Because IBM announced it would discontinue full maintenance of the old computers supporting the existing system by December 1979, NFC made that date its target for the redesigned system. The target date was not met, and NFC found it necessary to redefine the project in two phases:

--Phase I, or "the minimum system," which would generate payroll tapes for disbursing centers and perform other essential functions.

--Phase II, the balance of the system, which would generate personnel accounting reports.

NFC considered it important to complete phase I by the old computers' maintenance deadline. However, NFC now estimates that phase I will be implemented by October 1981 and phase II by July 1983.

NFC's slippages in completing the redesign will conservatively add more than $3.3 million to total project costs. NFC does not routinely track ADP costs. We obtained such information from various special reports and officials' estimates, filling gaps through averaging techniques and applying past estimated resource costs. Based on the redesign justification, recent NFC plans, and fragmented information on expended staff time, we estimated the staff time overrun at more than $547,000 (unadjusted for salary escalation). Also based on NFC information, we estimated that operating the second-generation equipment from the original completion date to the revised completio date will add about $2.7 million to the cost. This estimate excludes power, cooling, space, and indirect labor costs, which were not reasonably available. Additionally, NFC incurred cost of more than $104,000 in assuring that emergency backup would b available for the old computers.

NFC initially developed overall project plans but did not continue to update them as the project slipped. Also, NFC did not perform the detailed planning to the degree necessary to assure that resources were effectively coordinated. For example, the same programers/analysts responsible for redesign tasks were also heavily involved in program maintenance and other software projects without the establishment of clear priorities. Detailed plans were incomplete or out of date and were not coordinated into a comprehensive document until we suggested this be done.

Until late in the project, the lack of effective planning was compounded by an inadequate progress reporting system. The programers reported their progress to an independent monitor (see below), who prepared manual reports which varied in degree of quantitative information shown. While they noted mounting slippages by sometimes analyzing progress on major subsystems, these reports did not adequately demonstrate the magnitude of the problem. An August 1979 report indicated that phase I would be completed no earlier than April 1980. In September, the NFC Director insisted this effort would be completed in April 1980; however, upon performing the more detailed planning we suggested, NFC found phase I would slip 6 additional months.

After we explained our concerns, the Director reemphasized the priority of this project, reduced unnecessary maintenance, and instituted more effective planning procedures. The programers also developed an automated progress reporting system which focused management attention on surfacing problems. We believe these actions will enhance the probability that the project will succeed if they are institutionalized.

NFC did assign project managers to the redesign effort. However, the project managers functioned more as project monitors because they had no line authority over a number of persons heavily involved in the redesign effort. For example, one project manager felt obliged to approach normal line supervisors before directing these persons, especially to shift emphasis from maintenance activities to the redesign. On at least one occasion, this problem was brought to top management's attention but received no action.

Central accounting
system development problems

Developing and implementing USDA's central accounting system (CAS) is expected to be completed more than 10 years after its initial target date. In addition, our estimates show that the costs to complete development of CAS may exceed initial planned costs by about $13.7 million. Although charged with developing CAS, NFC was hindered in its development because (1)

agency resistance forced an early redefinition of the project and numerous schedule changes and (2) a Department reorganization erased much of the project's early progress.

Nonetheless, the management of this project was ineffective. We found USDA did not prepare a cost/benefit analysis, conduct an adequate user requirements analysis before developing CAS, or maintain project cost data. Further, NFC did not coordinate with USDA agencies the development of comprehensive implementation plans.

NFC has neither estimated the total cost of this project nor accumulated its costs to date. However, based on the staff-year estimates of NFC officials, we estimated that the requirements and development efforts alone have exceeded $8 million to date and will approach $15 million before completion. The $8 and $15 million were our calculations based on NFC managers' estimates of staff-years spent to date and projected time to complete the project. We estimated the cost per staff-year based on data on hourly rates and fringe benefits used by NFC as justification for initiating another software project. We assumed that average annual staff-years required for the project will continue at the same level as in the past. This estimate does not include the very significant costs of user involvement and operation of duplicate systems, software maintenance, computer resources, indirect labor, and cost escalation. The initial project plan estimated that about 32 staff-years would be required, which should have totaled less than $1.3 million based on NFC data on cost per staff-year.

The development of CAS was mandated by Secretarial memorandums in 1972 and 1973. The original objectives of CAS were to provide uniform agency accounting reports and to bring all covered USDA agencies into the system by January 1975. These objectives were not met. Citing different management needs, USDA agencies objected strongly to the uniformity concept, thereby forcing NFC to develop tailored reports for each agency and adopt a gradual implementation strategy.

Continued agency objections to CAS and a departmental reorganization resulted in additional slippages, and full implementation projections were changed to 1985--10 years later than initially planned. In 1977 USDA reorganized, merging some agencies or staff offices which had been implemented onto CAS into agencies which had not. Consequently, the work performed for several implemented agencies was lost.

Agencies are continuing to resist or refuse to join CAS. One agency, scheduled for implementation in 1981, surveyed other agencies' satisfaction with CAS services. Based on its findings, it refused implementation. We did not attempt to verify

the agencies' complaints regarding late or inaccurate reports. A 1980 Office of Inspector General report, however, confirmed that agencies lacked confidence in CAS reports.

We believe agency resistance to CAS may have been mitigated by (1) a cost/benefit study and (2) an adequate user requirements analysis for the entire system. A cost/benefit study could have demonstrated the benefits of joining CAS. Conversely, the study could have demonstrated to USDA top management that it was not cost/beneficial to develop CAS.

More extensive agency involvement in developing implementation plans to join CAS might have alleviated agencies' recent resistance. Agencies scheduled to join CAS in succeeding years were identified on NFC project sheets before NFC obtained their firm commitment. Rather, NFC obtained written agreements from the agencies just prior to the time it began detailed requirements and development work for them.

The CAS development project has taken far longer than and bears little conceptual similarity to the system described in the Secretary's memorandums. Because of the changes in technology, organization, and management requirements which have occurred over this extended development period, USDA should consider suspending further development until a comprehensive reexamination of the concept, cost, and benefits is performed. If the study demonstrates the concept is viable, agency resistance could be mitigated.

MORE TOP MANAGEMENT INVOLVEMENT AND PLANNING NEEDED IN AGENCIES' CONVERSION EFFORTS

Because of computer upgrades at USDA computer centers in 1977 and 1978, USDA agencies found it necessary to devote considerable time and resources to convert applications software to new computer systems. Not all these conversion efforts, however, were initiated with comprehensive plans, adequate top management involvement, and full-time project managers. Consequently, lengthy delays occurred which resulted in substantial dual computer operations cost and continued use of obsolete and high-risk computer equipment. Conversion problems of the USDA National Finance Center and the Agricultural Stabilization and Conservation Service follow.

National Finance Center

For several reasons, including inadequate planning and project management, NFC's conversion of most existing software applications to new computers will greatly exceed time and cost estimates. Planned for completion during fiscal year 1979, conversion probably will not be completed until 1983 at a cost overrun which we estimate at about $6.8 million.

In 1978 NFC competitively acquired a Honeywell 66/80 system to replace its second- and third-generation IBM computers. USDA's initial strategy was to use a contractor to convert most of NFC's application software to the new computer. NFC, however, prepared an analysis which showed it would be more cost effective to convert these applications in-house. NFC's in-house conversion efforts began about June 1978, but were halted a year later. Only 296 of NFC's 1,100 initial applications had been converted when the effort was halted.

NFC's decision to perform the conversion in-house was based on an analysis which did not adequately consider overall staff availability in relation to other NFC projects such as the CAS development and the payroll/personnel system redesign. The analysis showed that the in-house alternative would require only about 2 staff-years more than required to support a contractor conversion effort; therefore, it appeared cost effective to avoid the contract price of more than $700,000. Our analysis, however, shows NFC probably did not have sufficient uncommitted staff-years because of staff requirements for the other NFC software activities.

In addition to a questionable analysis, NFC's in-house conversion effort did not include a relevant conversion plan. NFC's conversion plan was only a list of application programs that were to be furnished to a contractor. These lists did not show detailed time estimates or consider existing staff commitments. That is, the same staff committed to the in-house conversion effort were also committed to the massive payroll/personnel system redesign and CAS efforts. In addition, the lack of planning was compounded by an ineffective system for tracking conversion progress.

Conversion postponed for questionable reasons

About a year after it began, the Director of NFC indefinitely halted the conversion effort because of

--technical problems with the new Honeywell computer,

--doubts about the capacity of the new computer, and

--the need to devote more staff time to the slipping payroll/personnel system redesign effort.

We believe these reasons were not a valid basis for deferring project completion until the end of fiscal year 1983, as currently planned. We concur that more emphasis was needed in the payroll redesign effort but believe some resources for conversion could also have been redirected from less beneficial projects and unessential maintenance. Further, the technical problems influencing conversion were reportedly soon overcome, and there was little support for the computer capacity fears. Moreover, conversion is a phased process; as systems were converted

for use on the new computer, the impact could have been assessed. Sufficient lead time would have been available to justify and procure additional computer capacity if necessary.

Conversion cost overrun

Rather than saving $604,000 as USDA testified in 1980 appropriations hearings, we estimated that NFC will spend at least $6.2 million more by performing the conversion itself than would have been spent in contracting it out. Almost $5.9 million of this total overrun resulted from extended operation of the old computer from the time conversion should have been completed.

Calculating the cost of NFC's conversion cost overrun was complex. (The following explanation is only a general statement of our methodology.) Our estimate included the cost of extended operation of the old computer and the cost overrun on programer labor. Our estimate of the monthly cost (about $120,000) to operate the computer equipment until released was calculated based on information provided by NFC which covered personnel cost, equipment rental and maintenance, space, and power. The conversion was originally planned for completion about July 1979, but later NFC revised this to September 1983, a slippage of 50 months. Our estimate for extended operation came to about $5.9 million. In addition, we estimated that there will be an overrun on programer labor which will amount to about $900,000.

NFC officials indicated that our estimates of cost overruns on its software projects appeared high. However, NFC does not track software project costs and did not provide us with its estimates of actual project costs. Therefore, we had no reason to change our cost estimates.

Agricultural Stabilization and Conservation Service

Because of inadequate planning, top management involvement, and procedures to monitor progress, ASCS Kansas City Commodity Office's conversion efforts floundered for 3-1/2 years with little progress made. Scheduled for completion in June 1981, it appears conversion will be delayed until 1983 or later. Consequently, the Department's Kansas City Computer Center must continue to operate a redundant computer system through this period at additional costs estimated at about $1 million. Furthermore, in order to manage grain inventories valued at $1.43 billion, ASCS must continue to rely on an inventory system which was considered obsolete and inefficient in 1977.

From May 1977 through December 1979, the Commodity Office pursued the following approaches to convert and/or redesign its two major inventory systems, the processed commodity inventory system and the grain inventory system:

--Use a commercial vendor to convert both systems.

--Convert both systems "as is" using in-house personnel.

--Develop a new inventory system to replace both systems.

--Redesign only the grain inventory system and convert the processed commodity inventory system.

None of these approaches, however, included (1) comprehensive project plans with milestone dates, (2) provision for full-time project managers, and (3) procedures to monitor and report progress. Accordingly, ASCS top management's knowledge of these efforts was inadequate for monitoring and control purposes.

In December 1979 the ASCS Deputy Administrator for Commodity Operations directed the Commodity Office to prepare a comprehensive project plan, assign a full-time project manager, and submit monthly progress reports. In May 1980 the Deputy Administrator finally recognized after 3 years that the Commodity Office was not progressing in its latest conversion/redesign effort. As a result, ASCS top management directed the Commodity Office to contract out the conversion of its grain inventory system.

Meanwhile, the Commodity Office succeeded in moving its processed commodity inventory system to a new computer system. Nevertheless, this inventory system still needs to be converted to a standard computer programing language.

In November 1980 ASCS issued a request for proposal for the conversion of the grain inventory system. In February 1981, however, ASCS suspended its contractual efforts because the vendors' bids were considerably higher than expected. The Commodity Office's present plan is again to redesign the grain inventory system in-house. This latest approach is not expected to be completed until 1983 or later.

While the Commodity Office is again attempting to redesign its grain inventory system, the Kansas City Computer Center must continue to operate both a Honeywell and an IBM computer system. The Honeywell system was acquired in 1978 to replace the center's older IBM system and to provide hardware support to the Commodity Office's inventory systems. USDA, however, cannot release the IBM equipment until the Commodity Office completes the conversion of the grain inventory system. Consequently, the center must operate both the Honeywell system, which is underutilized, and the IBM system through 1983, or 2-1/2 years longer than originally planned, at an additional cost estimated by us at more than $1 million. Our estimate is based on a 1980 analysis prepared by the Kansas City Computer Center of the cost to operate the IBM system over a 3-year period. We calculated the cost to operate the computer over a 2-1/2-year period by assuming operating costs would be constant over this period and reducing the center's data by one-sixth.

AGENCIES ARE NOT DEVELOPING AND REPORTING LIFE-CYCLE COSTS FOR APPLICATIONS SOFTWARE SYSTEMS

USDA agencies included in our review were not fully estimating, developing, or reporting life-cycle costs for their applications software systems, although the Forest Service is developing a life-cyle approach. Without life-cycle cost data, agency top management cannot adequately evaluate the reasonableness of costs for applications software activities.

OMB Circular A-109 defines life-cycle cost as the sum total of the direct, indirect, recurring, nonrecurring, and other related costs incurred, or estimated to be incurred, in the design, development, production, operation, maintenance, and support of a major system over its anticipated useful life span.

With life-cycle cost information, top management has better cognizance and control over agencies' ADP operations. Accordingly, managers can make more timely and informed decisions to avoid prolonged development cycles, extensive cost growth (actual costs exceeding estimated costs), and deficient and unnecessarily expensive ADP operations.

UMIS management hindered by lack of cost data

The importance of developing and tracking life-cycle costs is demonstrated by the problems FmHA had in developing UMIS. Before beginning its development, FmHA did not prepare cost estimates to develop and operate UMIS. It also did not use a project control and cost system to track and review each stage of system development. As a result, FmHA could not accurately provide information on (1) UMIS' actual development costs, (2) estimated costs to complete development, and (3) estimated costs to operate or maintain the system. We believe this lack of adequate cost data seriously reduced UMIS managers' ability to plan and control the system's development.

NFC billings to users do not include fair share of software costs

Some agencies pay disproportionately for NFC services because the center does not identify or appropriately charge out software costs. In its efforts to complete the centralization of payments, collections, and accounting systems for the Department, NFC has spent millions of dollars for software development and operation. The extent of such software work may vary substantially from agency to agency, especially in the case of the central accounting system. However, NFC bills nearly all of its overall costs to user agencies based simply on input transactions--for example, vendor invoices, travel vouchers, and accounting entries, which are not necessarily related to ADP costs incurred. As a result, elaborate software

systems developed and operated by NFC for some agencies are subsidized by agencies with less-extensive ADP needs.

To properly charge agencies, NFC must begin tracking ADP costs. Although we found that ADP costs represent an estimated 39 percent of its budget, NFC does not attempt to track the costs of operating computer resources, developing software systems, and maintaining existing software. Sometimes NFC establishes target costs or projected savings for large software projects, but it does not attempt to measure its performance against these goals.

Our "Guidelines for Accounting for Automatic Data Processing Costs" (1978) recommends that all agencies account for such costs in ways useful for management, budgeting, and external reporting. In September 1980 OMB issued Circular A-121 which, among other things, requires agencies to account for the full cost of operating data processing facilities, including costs of software development. However, NFC believes it is exempt because the OMB requirement applies only to computer centers which support multiple users. While NFC may be the only direct user, it charges out all its operating costs to USDA agencies. We believe properly accounting for ADP resources is fundamental to effective management and NFC and USDA agencies would benefit if NFC followed our guidelines and the OMB circular.

SOFTWARE MAINTENANCE IS A COSTLY ACTIVITY NOT BEING CONTROLLED

USDA does not accumulate cost data on total software costs or on software maintenance. The Director of the General Services Administration's Software Development Center recently told us that software maintenance costs the Federal Government at least $1.3 billion per year, or about 22 percent of the total estimated software costs of $6 billion. Applying this percentage to our earlier $105 million estimate for total USDA software costs, we estimate USDA's fiscal year 1981 cost for software maintenance at $23 million. This is a very conservative estimate. Our discussions with Forest Service, ASCS, and NFC ADP officials indicated that actual maintenance costs are much higher. The Department, however, has not established formal policies or procedures to control and cost software maintenance activities. Consequently, USDA top management has limited overview of software maintenance activities and associated costs.

Software maintenance is work performed on application software after it is placed into operation either to make it do more or different tasks, to remove errors, or to reduce operating costs. These maintenance activities are commonly referred to as enhancements, modifications, or optimizations.

Our recent software maintenance report 1/ showed that Federal agencies generally are not managing or controlling software maintenance. Further, the agencies generally are not accumulating or tracking software maintenance cost data. We found these conditions at NFC and at the ASCS Management Field Office. At NFC, the Director acknowledged placing too much emphasis on unnecessary software maintenance at the expense of other software projects. NFC is implementing a system to manage software maintenance; however, the system does not accumulate or track cost data. The ASCS Management Field Office also devotes considerable resources to software maintenance. A Field Office official estimated that 75 percent of the office's programers/system analysts' efforts are directed toward software maintenance. Nevertheless, the Field Office does not properly manage or control these efforts. For example, requests for modifications/enhancements generally are not formally approved, documented, or costed.

Because of these weaknesses in managing, controlling, and costing software maintenance, USDA needs to establish formal policies and procedures for this high-cost activity. With formal controls, USDA can minimize unnecessary software maintenance.

NEED FOR TOP MANAGEMENT ASSISTANCE

Effective planning and management control are necessary if USDA agencies are to obtain effective and efficient use of the over $100 million they spend annually on ADP software applications, conversions, and maintenance. Because of the cost of ADP systems and their importance throughout USDA, top management must be properly involved in major software projects from planning through implementation.

In our recent report, "Government-Wide Guidelines and Management Assistance Center Needed To Improve ADP Systems Development" (AFMD-81-20, Feb. 20, 1981), we noted that management deficiencies and resulting software problems have cost Federal agencies much money, time, and effort. We pointed out that Federal agencies have failed many times in developing large, complex ADP systems because they have neither the proper guidance nor the necessary assistance from top management. We stated that some Federal agencies do not have (1) sufficient and effective top management involvement and direction and (2) a strong central office to facilitate agencywide planning, coordination, and control of ADP resources. We recognized that agency managers accept the need to exercise greater control over data processing but are handicapped by their unfamiliarity with the technical aspects and related problems of ADP. Thus we recommended that a management assistance center be established to

---

1/"Federal Agencies' Maintenance of Computer Programs: Expensive and Undermanaged" (AFMD-81-25, Feb. 26, 1981).

assist agency top management in planning, designing, acquiring, and evaluating large, complex ADP systems development projects.

Our evaluation of USDA's management of software projects shows that its problems and weaknesses are similar to those we have identified throughout the Government. Based on its agencies' need for management assistance, its size, and the importance of software to its programs, we believe that USDA should establish its own technical assistance center modeled after the Government-wide center recommended in our report.

USDA's center would

--assist agencies in planning, designing, and acquiring ADP systems;

--independently review and evaluate agency ADP plans and system development plans, designs, and projects;

--provide independent assessments, suggest alternatives, and validate requirements and economic analyses for major information system budget and acquisition proposals; and

--develop standards, guidelines, and policy options, as well as develop new and innovative prototype applications of ADP and data communication technology.

CONCLUSIONS

In developing, converting, and maintaining ADP systems, sound management principles must be followed to ensure success--ADP systems that are cost effective, meet user needs, and meet cost and time limits. At three USDA agencies we identified millions of dollars in estimated cost overruns and delays of up to 10 years in developing new ADP systems and converting old systems to modern equipment. These USDA agencies are not following accepted management principles required to effectively monitor, plan, and control their software projects. The projects lacked adequate management oversight, planning, and control because agencies did not assign full-time project managers and use effective control techniques such as (1) establishing milestone dates, (2) monitoring progress and comparing established milestones and dates at selected intervals, (3) developing and tracking life-cycle costs, or (4) controlling maintenance activities.

The Department's central ADP office's oversight over agency software projects is inadequate. Because of inadequate oversight, the central ADP office cannot ensure the effective and efficient development and use of USDA's software systems.

It is also apparent that some agencies lack the managerial and technical expertise to complete software projects on time and within budgets. A Department management assistance center to provide assistance to USDA agencies would help improve software efforts.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary provide the senior official with clear authority over agency software projects. This authority would require agencies to submit to the senior official the following documents and data for software projects meeting established dollar thresholds:

--Feasibility studies, cost/benefit analyses, and user requirements analyses.

--Comprehensive project plans that include milestones and dates and identify project managers.

--Procedures that will be used to monitor the project's progress and track its costs.

--Progress reports showing percent of completion and costs to date, and estimated time and cost to complete the project.

We recommend that the Secretary establish, under the direction of the senior official, a management assistance center for computer software and systems development.

We recommend that the Secretary direct the senior official to establish formal procedures and policies for software maintenance activities and for life-cycle ADP cost accounting.

CHAPTER 4

STRONG MANAGEMENT CONTROL NEEDED FOR MORE EFFECTIVE AND EFFICIENT COMPUTER CENTER OPERATIONS

USDA's five departmental computer centers operating in Washington, Fort Collins, Kansas City, St. Louis, and New Orleans are not effectively and efficiently managed. One or more of the centers have experienced problems with (1) providing users with consistent, quality service, (2) using computer resources efficiently, (3) receiving adequate workload forecasts from agencies, (4) retaining obsolete equipment longer than planned, and (5) preparing accurate and useful information on capacity, performance, and service levels.

Data Service's typical approach in dealing with user dissatisfaction is to acquire more computer hardware. Other alternatives need to be emphasized including efforts to better utilize existing ADP resources and improve forecasting of future requirements. Such efforts will require USDA to develop a program for evaluating and managing the performance of its large computer centers. Stronger management control is also needed to ensure that agencies use the centers' computer resources more efficiently and prepare meaningful workload forecasts.

In addition to the overall management issues, the House Government Operations Committee has been concerned about the management of the New Orleans computer facility since its takeover by NFC in 1977. In the early 1970s USDA's computer centers were consolidated and put under centralized management because a study had found that proliferation of single-agency computers was wasteful and ineffective. Consequently, we believe that before an agency acquires control over a large-scale computer facility, (1) the agency should economically justify such a decision and (2) computer center operations should be periodically reviewed to ensure efficient and effective use of center resources. These steps were not performed with the New Orleans computer facility.

PROGRAM NEEDED TO MEASURE AND ASSESS COMPUTER PERFORMANCE

A formally structured program providing accurate, quantitative, and well-documented information on performance and capacity is an effective method for managing computer resources. Such a program is usually referred to as a computer performance management (CPM) program.

The need for a progam like CPM was recognized by the Federal Government in 1977 when the National Bureau of Standards published Federal Information Processing Standards Publication

49, "Guideline on Computer Performance Management: An Introduction." 1/ This publication defines a CPM program as "any structured effort * * * to measure and evaluate the performance of a computer facility in support of established management goals and objectives."

The General Services Administration has also recognized the need for developing such programs. In November 1978 GSA published a very detailed document entitled "Management Guidance for Developing and Installing an ADP Performance Management Program." These publications are only two of many that provide guidance on the use of programs to manage computer centers' performance and capacity.

"The EDP Performance Management Handbook," 2/ published by Applied Computer Research, describes CPM as a process for (1) negotiating service level objectives between data processing and its users, (2) tracking actual service levels provided users, and (3) "tuning" the data processing organization until objectives are met. The definition also suggests capacity planning for equipment and staff to meet established service level objectives.

A principal function of CPM is optimizing the use of system resources. This includes tuning software, configuring the equipment, allocating resources, determining the capacity of the components individually and collectively, setting standards for performance, providing guidelines for more efficient use of resources, and using appropriate tools and techniques for measuring and evaluating system performance. These actions should result in more cost-effective use of equipment, better use of personnel, and increased capacity.

Although Data Services has established some elements of a CPM program, these elements have not been effectively consolidated nor have reports been useful to top management. An effective CPM program could improve service to users and increase the efficiency of computer center operations.

CAPACITY PROBLEMS HINDER COMPUTER CENTERS' ABILITY TO PROVIDE CONSISTENT, QUALITY SERVICE

Users of USDA computer centers generally have expressed dissatisfaction with the centers' computer systems' availability,

---

1/The Federal Information Processing Standards Publication Series of the National Bureau of Standards is the official publication relating to ADP standards adopted and promulgated under the provisions of Public Law 89-306 (Brooks Act).

2/In private industry electronic data processing (EDP) is usually used rather than automatic data processing (ADP), which is used in the Federal Government.

accessibility, turnaround, and response time. The computer centers have not consistently met users' expectations and information needs. The centers have had continual problems in meeting these needs and are not efficiently using available capacity. 1/ To solve these problems, Data Services continues to acquire more equipment.

Capacity problems at individual computer centers are discussed below.

Fort Collins Computer Center

Since its opening in February 1974, FCCC has incurred computer capacity problems. By March 1975 workload capacity on the UNIVAC 1108 equipment had reached a saturation level, and not until September 1976 was the computer replaced with a newer, more capacious UNIVAC 1100/42. This computer capacity was expanded in late 1978 and replaced in September 1979 with a UNIVAC 1100/82. Although the new UNIVAC 1100/82 was intended to have a 6-year life, the computer was upgraded sooner than expected. FCCC upgraded the UNIVAC computer to an 1100/83 in April 1980.

Forest Service's access of the computer system at FCCC has been inadequate. For example, according to statistics provided by the communications supplier, users attempted to access FCCC 249,479 times in January 1980 but were successful only 19,035 times. The problem was caused by an expanded use of remote terminals in the Forest Service and an inadequate number of ports. Users of remote terminals gain access to the computer through communication ports maintained by the center. The number of ports limits the number of terminals that can simultaneously access the computer.

Kansas City Computer Center

This center has the capacity to serve users' needs 24 hours a day, but the computer is used essentially during prime time (8 a.m. to 4 p.m.) and only on a limited basis between 4 p.m. and 8 a.m. Even though user organizations are not using this available computer time, they are concerned about the lack of adequate KCCC capacity for prime-time hours.

St. Louis Computer Center

Because of delays in developing UMIS, coupled with increasing FmHA workload and the impact of new projects, the current Burroughs computers must be maintained longer than planned.

1/The capacity (power) of a computer system is defined as the maximum rate the system can perform work. The efficiency with which this system's capacity is applied determines the level of service for its users.

Based on SLCC data, these computers are also nearing capacity and are experiencing downtime problems. Moreover, the significant delays in completing UMIS or its replacement information system result in additional costs to continue operating SLCC. USDA planned to discontinue the computer center operation in 1979. The Kansas City Computer Center was established in 1978 and purchased equipment to support UMIS when it was completed. Since SLCC continues to operate its own computer systems, cost savings will not be realized as planned.

Washington Computer Center

Based on our discussions with users, we found that they were satisfied with WCC's batch processing turnaround time but not with the slow response to transactions entered through computer terminals. Some monitoring of the computer system performance has occurred to assure that it was continuing to operate efficiently. However, users' needs for software maintenance and developmental work exceeded available capacity.

National Finance Center

NFC's Honeywell 66/80 computer system now has two central processing units. NFC management believes more capacity will be needed to process an increasing workload generated by new and expanded application software projects. Also, capacity may be strained as the existing workload on older IBM 7080 and 360 computers is transferred to the more modern Honeywell computer system.

Data Services approach is to buy more equipment

In order to ease these capacity problems at the computer centers, Data Services' approach has been to buy more equipment. Near the completion of our field work, the Department acquired or planned to acquire computers at all five computer centers.

--In early 1981 FCCC acquired an additional CPU for its UNIVAC computer system. This acquisition occurred sooner than planned. In addition, FCCC obtained on a sole-source basis a UNIVAC 1100/81 computer system dedicated to processing the Animal and Plant Health Inspection Service Brucellosis Information Program.

--KCCC ordered a third computer processor from Honeywell in October 1980, 21 months earlier than planned. This will result in increased lease payments over the 21-month period of about $291,000. KCCC also intends to acquire an IBM 370/158 computer system that will replace the center's obsolete IBM 7074 and 1401 systems.

--SLCC intends to replace its present Burroughs computer with a Burroughs B4890, using a sole-source procurement.

--In July 1980 WCC installed an IBM 4341, a medium-sized computer system. WCC has also requested a delegation of procurement authority from GSA for a procurement of an IBM 3033, a large-scale computer system.

--NFC planned to obtain a third Honeywell CPU under an existing contract. However, the Department determined this could not be done and is reassessing its information processing needs and exploring procurement alternatives.

WEAK MANAGEMENT CONTROL--THE PRIMARY CAUSE OF COMPUTER CAPACITY PROBLEMS

In a number of areas Data Services has demonstrated weak management control over computer center operations and in setting, maintaining, and forecasting computer capacity. This condition has resulted in problems with

--inefficient operation of the computer centers and in management of existing computer capacity and

--inadequate performance standards and measurement.

The absence of effective management practices and decisionmaking by Data Services contributes to inefficiency, inaccuracy, and overburdening of USDA computer centers. We believe that USDA will not provide users with consistent, quality service and competitively procure computers as a normal way of doing business until a central management office is given sufficient authority and assumes a stronger role in managing the Department's central ADP resources.

Inefficiencies at centers affect available computer capacity

Poor data processing practices contribute to inefficient operations and place unnecessary demands on available computer capacity at the USDA centers. Examples of these practices are

--the absence of a systematic review process by Data Services and users to improve the efficiency of large applications that use unnecessarily high amounts of computer center resources,

--user inattention to proper file-management practices, and

--poor scheduling of processing time during nonprime hours.

The existence of these poor practices, along with the absence of a policy and program to deal with them, is not consistent with claims of computer saturation and requests for more equipment.

These inefficiencies also point to inadequate management control over computer use by both users and the computer centers.

We are concerned that the computer centers are aware of these deficiencies yet permit them to continue. Before Data Services can adequately justify requests for more capacity, it must demonstrate efficient use of existing resources.

Applications are not systematically reviewed for ways to improve efficiency

Data Services has not developed a systematic review process to ensure that large software applications do not use unnecessary amounts of computer center resources. The OIG noted in a 1978 report that Data Services does not require agencies to use available tools and services to increase the efficiency of ADP applications. Although Data Services recognized the significance of ADP application efficiency in 1979 when it established a task force to study the problem, no action was taken on the task force's report. This lack of emphasis on and control over software application efficiency results in a strain on computer capacity.

In our report, "Wider Use of Better Computer Software Technology Can Improve Management Control and Reduce Costs" (FGMSD-80-38, Apr. 29, 1980), we found that the proper application of software tools and techniques to make applications programs run faster and require less computer storage can reduce the computer resources needed to run users' applications and thus postpone the need to get more expensive, bigger computers. In that report we identified five computer installations where significant savings were attributable to applications program performance improvement which reduced the machine resources required to run applications software, freeing the resources for other work. For example, at one installation $2.4 million in personnel and computer resources were freed by using software improvement tools and techniques, thus helping the installation delay an equipment acquisition.

Recognizing that it must seek ways to handle its capacity problems other than through the purchase of additional equipment, Data Services formed a task force to study the efficiency of applications software. The task force report, dated July 11, 1979, concluded that one way to solve the capacity problem is to increase the effectiveness of its existing hardware by identifying applications that used high resources and determining the extent to which they could be made more efficient. The report also included recommendations for a software application review process; however, no action was taken on these recommendations.

The Forest Service's forest planning model (FORPLAN) is an example of an application that could benefit from a thorough and systematic review to improve its efficiency and lessen its demands for computer resources. During our review, the Forest Service and

Data Services initiated steps to improve the processing efficiency for FORPLAN. FORPLAN is a linear programing application developed to meet the Forest Service's land planning needs. Under the 1976 Land Management Act, the Congress directed the Forest Service to prepare land management plans for each of its forests.

FORPLAN as initially designed is a strain on FCCC's computer capacity. Also, FCCC and Forest Service staff do not believe that FCCC can run FORPLAN for all field units because of the extensive computer time required. In addition, Forest Service officials were concerned that FORPLAN demands would severely restrict FCCC's ability to handle a large mapping program used with FORPLAN for land management planning and the processing of other Forest Service applications. Because of these potential effects, the Forest Service was seeking alternative computer facilities.

ASCS has done little to improve application efficiency. It does not require its ADP units to review application systems for efficiency. The agency's Management Field Office evaluates the adequacy of internal controls for newly developed or modified systems. However, the Field Office does not review the design of new or modified systems to determine if they are efficient. Field Office ADP officials told us they lack the time and people needed to make such efficiency reviews.

Poor file-management practices waste critical storage resources

USDA has procedures for efficiently filing and storing computer data, but users often overlook or avoid these procedures. Users are retaining seldom-used disk or tape storage on line for long periods of time. These conditions waste available computer storage and result in unnecessary acquisition of storage devices.

Although the computer centers develop criteria for using computer data, users often disregard these rules. The computer centers write, maintain, and distribute a users' handbook on managing computer file data. Particulars include on-line storage costs, overall system costs and benefits, methods of saving files, other basic measures for efficient file storage, and "archiving" of files. (Archiving involves transferring files from a computer's costly disk storage to less-expensive storage such as magnetic tape.) Computer files unused for a prescribed period of time are transferred to less-expensive storage media. Despite these cost saving procedures for handling computer files, some users override the system by needlessly accessing their unused disk files to show usage. In addition, users have requested that their files be excluded from archiving. When this occurs, files remain on the expensive storage devices indefinitely without being accessed. These poor file-management practices exist at the Kansas City Computer Center where on-line data files are unused for long periods.

The Fort Collins Computer Center is experiencing similar problems. In its January 13, 1981, report on FCCC, the OIG concluded that the center's user agencies were not adequately reviewing computer files stored at FCCC to determine which files should be purged. (Purging is the destruction of files that the user no longer needs.) The OIG review found that inactive files were retained because (1) people responsible for the review did not have the authority to purge these files without additional approval and (2) FCCC did not have an internal control system to ensure that users were performing meaningful reviews. The OIG stressed that user file-management reviews are necessary to help the center conserve available system resources. The OIG report also indicated that 95 to 98 percent of all archived files are due to inactivity rather than user request. In other words, users are not generally taking the initiative to remove files they no longer need.

Poor scheduling of computer time results in inefficient use of computer capacity

Inefficient scheduling of computer processing time has prematurely triggered requirements for additional computer equipment even though existing capacity was available. For example, because KCCC officials were unsuccessful in persuading users to improve computer time scheduling, equipment was required 21 months sooner than anticipated at a cost of $291,000.

KCCC is acquiring more computer equipment even though much of its non-prime-time computer capacity remains idle. KCCC's Honeywell computer system, installed in May 1978, was sized to process 40 percent of the workload during prime-time processing hours and 60 percent during the 16 nonprime processing hours. However, in 1980 the Honeywell system's users, primarily ASCS, were claiming a need for more prime-time processing capability even though these users were processing only 43 percent of their workload during the 16 nonprime hours. As a result, KCCC ordered a third Honeywell CPU to meet these demands for prime shift use. The ASCS Management Field Office, the largest user of the Honeywell system, accounting for about half of its current use, did not initiate action to relieve the capacity problem by scheduling work to non-prime-time hours.

Inadequate performance measurement and capacity management

An effective computer capacity and performance measurement program involving central management, the computer centers, and users has not been established. Data Services has not provided the necessary guidance for implementing a capacity and performance measurement program. The computer centers are not assessing capacities or measuring computer performance. Finally, poor user success in completing software projects on time is contributing to capacity problems.

Data Services provides little guidance

Data Services has not provided guidance to the computer centers on setting standards for user service levels or measuring performance against standards. As a result, the centers have not developed adequate standards and have little basis for measuring user service. Frequently, the centers learn about poor performance when users complain. Some of the important areas requiring performance standards for acceptable user service are batch turnaround time, interactive response time, consistency of response times, and reliability.

An adequate performance program also includes techniques for measuring and evaluating the actual service levels attained and uniform reports tracking the actual levels against the standards. An active program can identify potential bottlenecks or problem areas and can lead to corrective action.

Centers do not adequately measure performance or manage capacity

The USDA computer centers are not accurately assessing computer capacities or measuring performance. The computer centers have not (1) developed adequate baseline data, (2) accurately computed the practical capacity of their equipment, and (3) collected complete data on the performance of their input/output susbsytems. The monthly reports to Data Services are inadequate for management to evaluate performance. Finally, Data Services does not require agencies to submit data on planned applications so that the computer centers can determine the impacts on existing resources.

The computer centers have not developed adequate baseline data in the operations of their resources. Consequently, they have inadequate means of assessing the efficiency and effectiveness of their performance in meeting user needs.

In determining practical capacities, the centers are not considering some important factors which influence capacity, and thus their estimates of practical capacity are incorrect. For example, an important factor affecting the amount of practical capacity is the kinds of work processed by the computer systems. Varying kinds of work can affect the entire formula by which the centers compute their practical capacities. For example, timesharing services, which all centers offer primarily during prime processing hours, require more operating system overhead (unavailable computer memory for user applications) than batch work. For instance, WCC's overhead during prime time, when timesharing usually occurs, runs about 48 percent. During nonprime hours this center's overhead is probably 40 percent or less. But WCC uses 48 percent as the overhead figure in computing its practical capacity. As a result, the center's actual average overhead is distorted.

The centers' data on input/output subsystems is incomplete and not useful for determining computer capacity. Although the centers collect some data on their input/output subsystems, it is not collected and analyzed on a recurring basis. Further, the centers do not have any performance criteria to use as a basis for measuring performance. Thus, the data is of little value.

The monthly reports submitted to Data Services by the computer centers are inadequate for monitoring performance and capacity. These reports are the only routine communications between Data Services and the computer centers which address capacity and performance. These monthly reports, which show such information as number of jobs run and actual CPU hours used, are of little value to top management in determining the center's efficiency and effectiveness. The reports do not offer performance standards for comparison and evaluation to actual performance, and many areas of performance are not recorded. In addition, FCCC and WCC reports of CPU hours used are misleading and do not reflect true workload increases that occur when equipment is upgraded. Without adequate reporting, Data Services and the centers have no assurance that computer capacities are adequate and meet the users' information needs.

Data Services does not require agencies to notify the computer centers of new applications so that the impact of these new systems on existing resources can be determined. Center officials indicated in written responses to our background questionnaire that users do not routinely keep center officials current on the status of new and existing computer applications. One contributing problem is that Data Services manages and operates its computer centers as "utilities" to meet the needs of users but restricts its involvement in the process of determining user information needs and services. It believes its mission is to ensure that adequate ADP resources are available. In particular, the centers have not obtained workload data from user organizations and have not conducted analyses on a continuing basis.

Delayed software projects worsen capacity problem

As discussed in chapter 3, computer software conversions at the National Finance Center and Kansas City Computer Center have been costly and are incurring significant time overruns. Therefore, use of old computers continues while new equipment is not used to the fullest possible extent or is not used as intended when acquired. For instance, in 1978, both computer sites had Honeywell 66/80 computer systems installed, but conversion of computer applications from the old to the new computer systems remains incomplete. Also, USDA is still using many obsolete computer systems because users have had difficulty in completing large software projects on time.

In early 1977 USDA prepared a release schedule for 13 obsolete or obsolescent computers at Kansas City, New Orleans, and St. Louis. However, 11 of these systems have not been released. The obsolete computers are inefficient and vendor maintenance is no longer guaranteed. The 1977 schedule called for releasing five of NFC's computer systems by December 1979. Four of the NFC computers date from the early 1960s and one from the late 1960s. However, today all of these systems are still operating, and NFC has acquired another IBM 7080 which also dates back to the early 1960s. KCCC still has two older IBM 7074s and two 1401s. St. Louis has obsolescent Burroughs 3500 and 4781 computers which were scheduled for release. Also, this center was to close when the UMIS system became operational on the KCCC Honeywell system. Since the UMIS system is not operational, the obsolescent Burroughs computers are still running at St. Louis, processing FmHA's current accounting and information system.

In a recent report, "Continued Use of Costly, Outmoded Computers in Federal Agencies Can Be Avoided" (AFMD-81-9, Dec. 15, 1980), we concluded that the use of obsolescent computers involves unnecessary costs and problems. Our work showed that the operational costs of obsolescent Government-owned equipment can exceed the costs of using newer equipment even if the newer equipment is obtained on a short-term basis. Other, frequently unrecognized costs of using older equipment include less efficient processing, increased personnel costs, greater floor space requirements, and the need to rely on backup facilities when older, unreliable equipment breaks down. In addition to higher costs, agencies using obsolescent equipment face many operational problems, including inflexibilities imposed by limitations of the older equipment and frequent unavailability of the system due to maintenance requirements and equipment failures.

USDA also continues to experience problems with workload forecasts and the corresponding need for computer capacity. Inadequate forecasting has contributed to the saturation of computer capacity. Although workload forecasting is performed to justify procurement requests for additional equipment, it is not a continuing, formal process. In addition, USDA agencies, as discussed in chapter 6, do little long-range ADP planning outside the annual budget process. The lack of planning has contributed to the computer centers' inability to properly manage capacity.

Data Services had established a procedure for keeping abreast of new USDA ADP applications, but according to written USDA responses to our questions, it fell into disuse due to the lack of a vehicle for enforcing its use. The procedure is not being followed. The procedure applies to all applications in which development and operating costs may exceed $25,000 in any fiscal year. Information on Form ADS-1, Request for Agency Planning Data, the form needed to comply with the procedure, would provide the centers with computer processing requirements of the proposed application.

Users also need to establish performance service levels and adopt practices to properly forecast workloads and manage software projects.

LIMITED CENTRAL CONTROL OVER ADP OPERATIONS AT THE NATIONAL FINANCE CENTER

Data Services has exercised little oversight over the ADP operations at NFC. Until the 1977 USDA reorganization, NFC obtained its major computer processing support from the collocated New Orleans Computer Center. NFC's limited computer equipment consisted of minicomputers, used primarily for data entry and inquiry purposes. USDA then merged the New Orleans center into NFC to provide "streamlined management" over these resources, which were considered critical to NFC's mission. According to the Director of NFC, the merger was fully justified because NFC had become the center's only user, and the duplication of certain functions made no sense. However, no economic analysis of the merger was ever performed. In addition, USDA has not conducted a postimplementation review to ensure that the merger was working and that the center was efficiently operated.

The House Committee on Government Operations has expressed concern over this move. In a 1978 letter to the Secretary of Agriculture, the chairman indicated that the merger was not consistent with the stated purpose of large ADP computer centers that serve many users. The departmental computer centers were established to halt a proliferation of computers throughout the agencies. Department-run centers were to reap the benefits of sharing resources. We believe, given the economic benefits of large computer centers serving many users, that before an agency acquires control over a large-scale computer facility (1) the agency should economically justify such a decision and (2) computer center operations should be periodically reviewed to ensure efficient and effective use of center resources.

We believe that this merger must be assessed and justified. USDA should conduct a postimplementation review to determine if the merger should continue or whether the computer center should be returned to the control of a central office. Under the Paperwork Reduction Act, the Department's information functions should

come under the jurisdiction of the senior official for the Department. Therefore, the senior official should perform periodic reviews of the computer center to ensure that the center is operating efficiently and effectively.

CONCLUSIONS

Computer centers do not adequately provide consistent, quality service to users. Further, management does not have sufficient information to assess the performance of USDA's computer resources. In addition, computer capacity problems hamper the efficiency of computer centers, and procurement of more equipment is used to remedy capacity problems. Also, computer center management needs stronger controls and standards established to ensure the most efficient operation of the centers.

The senior official must conduct a rigorous examination of USDA computer center resources. In addressing its capacity problem at computer centers, USDA should first consider alternatives to acquiring additional hardware. The demands of user applications and the availability of hardware resources must be aligned so that resources will be available as demand increases.

Users frequently estimate their workload requirements with little accuracy. A formal forecasting and analysis process is needed along with more guidance from Data Services if workload forecasting is to be improved.

New and existing applications which have a considerable impact on hardware resources should be identified and analyzed. Applications which are determined to be inefficient should be submitted for a management review for action.

USDA needs a comprehensive computer performance management program to measure and evaluate the efficiency and effectiveness of ADP resources, including requests for ADP equipment, and assure greater control over the use of ADP resources.

Under the current USDA organizational structure, responsibility for managing, controlling, and using computer resources is divided between the users and centers. We believe that the senior official should involve his office with users to assure that computer centers are used more effectively and efficiently.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary of Agriculture direct the senior official appointed under the Paperwork Reduction Act to:

--Establish a computer performance management program, including objectives for user service levels; uniform reporting on performance, capacity, and utilization;

and standard operating procedures related to efficient use of computer center resources.

--Develop, implement, and enforce procedures for workload forecasts.

--Require user organizations to provide computer centers with timely and complete workload forecasts for use in the CPM program.

--Conduct a postimplementation review to determine whether the National Finance Center should continue managing its computer center. If the review shows NFC should not, responsibility for managing the computer center should be returned to a central office.

CHAPTER 5

USDA NEEDS TO GIVE A HIGHER PRIORITY TO ADP SECURITY

In the face of mounting evidence of widespread inadequate ADP security, USDA has given little emphasis to this subtle but vital aspect of ADP management. Effective security is especially important to USDA because it relies heavily on ADP resources to manage its multibillion-dollar loan/grant programs and administrative functions. Moreover, USDA's automated files contain sensitive program information and extensive data restricted from general access by the Privacy Act of 1974 (Public Law 93-579). Nonetheless, our past and present reviews, as well as several reports issued by USDA's Office of Inspector General, have documented security shortcomings. USDA has not been effective in assuring that identified deficiencies have been corrected.

Data Services, the office charged with the responsibility of managing USDA's ADP security function, has been unable to assure that agencies are following applicable guidelines and sound practices. As with other areas of ADP management, its role has been limited to providing guidelines, standards, and rendering advice rather than enforcing compliance. A strong IRM office, as discussed in chapter 2, with the authority and the mandate to emphasize security can provide the leadership necessary to make effective USDA ADP security a reality.

ADP SECURITY IS PARAMOUNT

Our earlier reports dealing with various Federal agencies have described serious and/or expensive computer-related losses such as

--more than $90,000 in fictitious welfare claims entered by a single clerk,

--nearly $100,000 in payments to fictitious companies based on fraudulent documents entered by a single employee, and

--the theft of a large volume of classified energy information by a single "burglar" via a telephone terminal.

Importance to USDA

Because USDA is a large, diverse organization with huge financial programs dependent on computer support, adequate ADP security needs strong emphasis. The USDA computer centers support agency management of multibillion-dollar loan and grant programs. For

example, the Agricultural Stabilization and Conservation Service made $3.9 billion in commodity loans during 1980 via the Kansas City Computer Center. The National Finance Center in New Orleans processes the USDA payroll, pays USDA's bills, and makes certain collections which totaled more than $4 billion in 1980.

These dollar volumes make USDA's computer facilities an attractive target for fraud and offer a potential for expensive human errors. Furthermore, each facility has significant personnel data in its automated files which should be given the special protection required by the Privacy Act. 1/ Partially because of inadequate security planning to protect sensitive and personal data, USDA was forced to abandon a proposed $398 million ADP procurement in 1975. (See app. I.)

An ounce of prevention

This potential for loss may be significantly reduced through an effective security program designed to ensure that (1) unauthorized uses of data processing resources are reasonably prevented and (2) authorized uses are carried out reliably, accurately, and with as little interruption as possible.

The elements of an effective security program may be classified into three categories.

--Physical security controls prevent unauthorized access to areas harboring the ADP equipment by such means as locks, guards, and badge identification requirements.

--Technical controls are built into the computer system to limit terminal use and protect programs from unauthorized changes. For example, passwords may be used to restrict access to a computer system or protect computer files.

--Administrative controls are procedures instituted by management to ensure the effectiveness of other controls. These measures include controlling the issuance and use of magnetic key cards for computer room entry and ensuring the development of adequate security/contingency plans.

1/The Congress included in the Privacy Act of 1974 a requirement for each agency to (1) establish appropriate technical, administrative, and physical safeguards to assure the security and confidentiality of records and (2) protect against any anticipated threats or hazards to their security or integrity which could result in substantial harm, embarrassment, inconvenience, or unfairness to any individual on whom information is maintained.

Security measures require front-end planning and consistent implementation; relegating them to a low priority creates an unacceptable risk. Office of Management and Budget Circular A-71, Transmittal Memorandum No. 1, dated July 27, 1978, "Security of Federal automated information systems," which provides instructions on security matters, requires agencies to

--perform risk analyses prior to the approval of design specifications for new computer installations and at other specified times;

--plan for contingencies--that is, interruptions in computer operations; and

--incorporate appropriate security features into software before it becomes operational.

CONTINUING DEFICIENCIES REFLECT A LACK OF DEPARTMENTAL OVERSIGHT

Although departmental ADP security guidance has been distributed to agencies, we and USDA's OIG continue to identify deficiencies throughout USDA. Several of these problems have been previously reported to the Congress and the Secretary of Agriculture. These inadequacies reflected a lack of departmental oversight.

OIG reports show continuing deficiencies

Major OIG audit reports issued in 1978, 1980, and 1981 illustrate continuing deficiencies in computer center security practices. We believe central office oversight could have prevented or corrected these problems sooner.

Washington Computer Center

Based on its review of ADP security at WCC, the OIG reported in October 1978, that over a 1-year period some 6,400 unauthorized computer file accesses had been made. The report stated that although no evidence of large dollar losses was found, a very real potential existed for large dollar losses, damage to agencies' operations, lawsuits, and embarrassment to the Department. It cited four causes for ADP security weaknesses: (1) a general lack of management concern and emphasis on computer security, (2) poor computer security procedures at WCC and among user agencies, (3) WCC and user agency noncompliance with existing Department security standards and guidelines, and (4) no central management organization with the day-to-day responsibility and authority for monitoring and enforcing computer security procedures and standards among the agencies.

About 2 years later the OIG issued another report on security at WCC. The report found that responsive actions were initiated by the Office of Operations and Finance in regard to the recommendations contained in the prior audit. However, there were areas in which the corrective action intended by O&F had not been implemented at the user agency level. OIG attributed this problem to a lack of followup by O&F to determine that new procedures were understood and fully implemented.

NFC, both a user and provider of ADP services, also reviewed the first WCC report. It identified several of the same weaknesses, such as unprotected sensitive files, but it did little to improve the situation, as discussed below.

Fort Collins Computer Center

In January 1981 the OIG issued a report on ADP security at FCCC. Again, the OIG found that user agencies were not complying with existing ADP security standards because agency management had not placed a high priority on ADP security. Specifically, users had not

--adequately protected valuable and sensitive files from unauthorized access,

--developed sufficient ADP security guidance to supplement departmental guidance, and/or

--ensured that security programs were implemented at operating levels.

Moreover, the inadequate user file-protection practices were worsened by the fact that FCCC did not properly safeguard user access codes. Physical security was also lax. Facility door keys and computer room access key cards were inadequately controlled.

Limited improvements in NFC security deficiencies

In December 1977 we issued a report 1/ describing security problems at both NFC and the New Orleans Computer Center, which later was merged into NFC. Many of these problems have not been corrected. We recommended that USDA reevaluate the security programs of NFC and the New Orleans Computer Center to assure that all needed safeguards were implemented before the major new computer system became operational. Although USDA agreed that a

---

1/"Cooperative Actions Result in More Economical Computer Acquisition and Improved Security at the New Orleans Computer Center" (LCD-77-118, Dec. 23, 1977).

reevaluation was necessary and stated that a commercial contract had been awarded for that purpose, we found no evidence showing that any such contract had been awarded. The acting NFC Director and the NFC security officer told us that they were unaware of any such contract having been awarded.

Persistent problems in physical security

NFC's ADP security measures depend heavily on installation security. However, we found several deficiencies which suggest this should not be the case. NFC is located on a fenced installation operated by the National Aeronautics and Space Administration, which contracted for the guard service. According to NFC's security plan, photographic badges are required to gain entrance to the installation, and all personnel are required to prominently display their badges.

As in our earlier review, we found that temporary badges were not controlled and that the guard service did not consistently examine badges. In random tests, we gained entrance to the facilities both on foot and by automobile displaying expired, improper, or no badges. We also found that even though many NFC employees did not display their badges while in the building, they were rarely if ever challenged. These weaknesses compound the risks created by the lack of system access controls discussed below.

At the conclusion of our review, physical barriers were improved and the guard service took certain actions which reduced the potential for unauthorized entry. Nonetheless, installation security may still be breached and should not be a critical element of NFC's security. NFC should give greater emphasis to the security measures it has direct control over, such as system access controls and program certification.

System access controls are still inadequate

NFC has taken some actions to improve its defenses against unauthorized access of its ADP systems. Nevertheless, the potential for unauthorized access remains significant.

In our 1977 report, we noted that data terminal controls were inadequate, especially in the area of sensitive file protection. Data entry devices were located in unsecured, open areas, and some data files were not properly protected. In our current review, we again found this condition, worsened by lax controls over passwords and user identification numbers that control access to data entry devices and the main computers. We also found that much of NFC's system software documentation is kept in unlocked cabinets, and the application program runbooks are shelved in

two unlocked rooms, freely accessible to anyone after normal working hours. Because such documentation can facilitate unauthorized software changes, it should be better protected.

NFC recognized that many of its systems running on an older computer were not adequately protected from unauthorized access. However, several sensitive systems are likely to be running on the old equipment for some time and merit bona fide protection.

In our earlier review, we also found that controls over access to NFC's computer rooms were insufficient and not properly enforced. For example, an extra magnetic key card was placed on a hook for convenience in entering the computer room. The security officer has tightened up controls over key cards and strengthened other physical controls, but he acknowleged that entry would still not be difficult. In his presence, we gained access to the computer room without benefit of a card or visible identification. The security officer believes the real barrier to unauthorized entry is the continual presence of NFC personnel. However, we believe this barrier depends heavily on employees' willingness to challenge anyone and the burden of their workload. In any event, it offers little protection against unauthorized access.

Continued lack of program certification

Our prior report noted "practically nonexistent" controls over programers. Among other problems, we found that some test (uncontrolled) programs, rather than controlled programs, were being used for production runs and that programers' work was not being independently tested to "certify" its accuracy and propriety. Such use of test programs is being more closely monitored, but the certification function has generally not been performed.

Virtually none of NFC's sensitive payments systems have been "certified" or independently reviewed to assure that the programs do only what they were authorized to do. While NFC is subjecting some redesigned payroll/personnel system programs to detailed independent review, these efforts were not intended to ensure the programs' propriety. The lack of certification effectively renders the controlled programs no better than the test programs and raises the potential for "Trojan horses," that is, imbedded lines of code written for fraudulent purposes.

LACK OF PLANNING INCREASES USDA's VULNERABILITY

USDA's ADP regulations and standards recognize the importance of security planning. However, Data Services has been unable to ensure that the ADP planning function was adequately emphasized by agencies and computer centers. As a result, security risks are not being satisfactorily dealt with, and

some USDA agencies have become highly vulnerable to extended interruptions in processing in the event of a disaster. Improved planning should be directed by management before a catastrophe forces such actions.

Deficient security plans

The adequacy of security plans submitted to Data Services varied widely. Although departmental information-processing standards require agencies and computer centers to submit or update security plans annually for review by Data Services, several agencies and computer centers had not done so. For example, the Forest Service had no overall plan but had submitted plans for certain regions or computer facilities. Two computer centers had not submitted timely updates to their security plans and had not included risk analyses, which are the bases for such planning efforts. Another center had submitted an incomplete plan.

The remaining center submitted a current security plan and risk analysis, both rated excellent by Data Services. However, the plan lacked adequate provisions for emergency offsite processing backup, and we found it was essentially not implemented. For instance, according to the plan,

> "Terminals are not secured by locks, but the installation is considered secure. Additional security is provided by unpublished telephone numbers, accounting codes, operator identification and password protection of sensitive files."

We found, however, that the installation was not secure, the identification and passwords were not safeguarded, and most sensitive files were not protected by passwords.

Contingency planning inadequate

Despite the well-recognized need to ensure continued ADP operations in the event of a disaster, USDA has given little emphasis to planning for such contingencies. As a result, this important function has given way to more immediate priorities at a growing risk to system users.

For example, the Kansas City Computer Center and NFC rely on each other as offsite backup for their Honeywell computers. However, they have not performed the coordination and detailed planning necessary to reasonably assure the feasibility of this approach. Issues such as the adequacy of peripheral devices, compatibility of system software, and the relative importance of applications to be supported have yet to be worked out. Written agreements have not been executed to assure that the centers will make emergency processing time available for each other. Furthermore, the critical software systems which must continue running during such emergencies have not been identified by users.

At the other USDA computer centers, OIG found users had done little contingency planning. For example,

--users had not identified or set priorities for their critical systems,

--offsite file protection procedures were inadequate or were not being followed, and

--one center's user manual overstated its ability to provide emergency backup support.

However, in responding to OIG audits, Data Services indicated it could only encourage agencies to make contingency planning improvements, not require that they do so.

DEPARTMENTAL EMPHASIS NEEDED

USDA cannot wait for a catastrophe to bolster its security program. It should reaffirm its commitment to adequate ADP security and provide the responsible office with the authority and resources necessary to assure full implementation of departmental guidelines. Particular emphasis should be given to detailed planning for emergency backup processing support. Departmental advisory efforts have not brought about a reasonable degree of security emphasis by agency or computer center top management. Therefore, an enforcement mechanism is needed to monitor and evaluate ADP security practices throughout USDA.

Security officers get little support from top management

Because of the nature of their duties and their organizational positions, ADP security officers must have the full support of top management. In USDA, however, effective security has been undermined by a lack of such support. Describing concerns raised in a meeting of agency and computer center security officers in September 1980, O&F noted that

> "It is not an overstatement to say that the Security Officers' perception is that indifference of top management to security concerns is their chief obstacle to achieving any realistic improvements in security administration."

A good security program may silently prevent computer crimes without the knowledge of management. Similarly, planning for emergency backup processing support may not be missed until the back-up is needed.

An effective program requires that a security officer be involved in planning, computer operations, procurement, software development, and records storage, among other activities.

Without strong support from the top, a security officer's duties are difficult to perform.

Strong oversight mechanism needed

Although ADP security is a less visible activity, it is necessary to protect USDA's ADP assets. Therefore, ADP security needs the support from agency top management and a strong, Department-level oversight mechanism. Data Services, the office charged with the responsibility for USDA's security program, has not attempted to enforce departmental security regulations.

Data Services' parent organization, O&F, maintains that its role is more properly one of providing advice and assistance rather than enforcement. For example, in response to recommendations contained in OIG's second report on the Washington Computer Center, O&F said

> "A number of the recommendations require O&F oversight of agencies' operational security or reemphasis of specific agency security responsibilities. Our policy has been to issue standards and guidelines for developing and maintaining adequate security, to assist agencies to the maximum when requested, to train security officers, and to review security plans and make recommendations for improvement.
>
> "We believe that operational security responsibility properly lies with the agencies and Departmental Computer Centers. We will continue to instruct, exhort, assist, and encourage those with operational responsibility, recognizing that progress, while steady, may be slow."

O&F provided a similar response to OIG's report on the Fort Collins Computer Center.

Citing the seriousness of deficiencies discussed in OIG's first Washington Computer Center report, the Secretary of Agriculture issued a memorandum which stated, in part:

> "This memorandum expresses my full support of a stronger computer security system within the Department. I strongly urge all managers, especially Assistant Secretaries and Administrators, to place more emphasis on computer security to insure that all USDA employees and contractor personnel comply with existing Departmental security standards and procedures."
>
> * * * * *
>
> "All personnel are reminded that the Assistant Secretary for Administration has the responsibility

and authority to establish the necessary mechanisms to monitor and enforce all security standards and procedures involving ADP activities within the Department."

Although this memorandum clarifies the enforcement authority of O&F through its immediate superior, the Assistant Secretary for Administration, O&F has relegated enforcement to the agencies where it has not worked. Both our findings and those of OIG suggest that the memorandum was not adequately heeded by agencies and the computer centers. A strong enforcement mechanism is needed to ensure compliance with security regulations and foster greater support for agency security officers.

O&F officials believe that the OIG should act as the enforcement authority for ADP security. OIG officials told us that enforcement of ADP security regulations should be the prerogative and responsibility of a central IRM office. We agree. The OIG is an audit and investigative service which rightfully identifies deficiencies and recommends courses of action to top managers, such as the Director of O&F.

CONCLUSIONS

Continuing security deficiencies among computer centers and agencies reflect inadequate Department-level emphasis on this vital area of ADP management. Users of USDA computer centers are particularly vulnerable to lengthy interruptions in processing because of a general lack of planning for emergency backup support.

The central ADP office's advisory and assistance orientation has done little to overcome these problems; therefore, a strong oversight mechanism is needed. We believe the office's parent organization, O&F, is uncertain of its enforcement authority.

The Secretary of Agriculture needs to reaffirm the Department's commitment to a sound security program and have the senior official establish the enforcement mechanism necessary to bring this about.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary direct the senior official designated under the Paperwork Reduction Act to

--vest USDA security officers with sufficient authority to enforce security regulations over information resources and ADP facilities and

--include, as part of the periodic reviews of information management activities required by the Paperwork Reduction Act, evaluations of agencies' compliance with USDA security regulations.

CHAPTER 6

NEED FOR A COMPREHENSIVE PLANNING PROCESS TO IMPROVE MANAGEMENT OF INFORMATION RESOURCES

USDA needs a comprehensive planning process to manage its ADP and other information resources more effectively. Such a planning process would include long-range planning, short-range and project plans, and a management review mechanism. Because of deficient planning practices, USDA frequently uses inefficient and outdated ADP systems in managing multibillions of dollars in assets. These problems are discussed more fully in chapters 3, 4, and 5. The impact of using inefficient ADP systems is not easily measured; however, in chapter 3 we identified millions of dollars in cost overruns for software development projects and delays in converting ADP systems to modern equipment.

Deficient planning practices discussed in chapter 4 also contributed to capacity problems when some computer centers suddenly became too saturated to provide acceptable computer services. We also noted in chapter 5 that a lack of security planning is increasing USDA's vulnerability to extended interruptions in processing in the event of a disaster.

A COMPREHENSIVE PLANNING PROCESS IS ESSENTIAL FOR EFFECTIVE INFORMATION RESOURCES MANAGEMENT

Limited ADP resources intensify the need for management to concentrate on what is important and avoid dissipating resources over too broad a range of activities. Modern ADP systems are very complex and frequently require years to design and develop. Such systems can be costly to bring to a successful operating mode. Unless economically justifiable, technically feasible, and operationally desirable, these high-priced systems either fail or performance falls short of expectations. Proper ADP planning is needed to assure that information systems meet expectations.

A comprehensive ADP planning process is also necessary to provide a basis for making long-range ADP decisions, setting ADP priorities, and managing ADP resources effectively. The plan is the final product of the planning process and should reflect agency ADP strategies, goals, and objectives. It could help ensure that the Department-wide ADP program is meeting mission requirements efficiently and economically. For example, a Department-wide plan can be used to identify opportunities for eliminating waste and duplication. In addition, the plan can be a valuable management tool for setting measurable milestones to achieve stated goals and objectives and thus provide a useful means to control ADP activities.

The formal planning and budgeting for ADP systems design and development activities, accompanied by periodic and milestone management reviews, are essential to managing and controlling ADP resources. All comprehensive planning of ADP systems must be developed with broad representation from the entire organization. Direct participation of employees across the organization will help in assuring continuity and success as the agency moves from the planning stage into actual design and development, and into operation.

Top management guidance on agencywide goals, objectives, and priorities will measurably improve the planning and decision processes. Clear assignments of responsibility, authority, and accountability for resources to be controlled and accomplishments to be achieved will also improve the efficiency, economy, and effectiveness of achieving the agency's goals and objectives.

A formal planning process should include:

--Formal, long-range, comprehensive plans, with supporting budgets, for ADP systems which encompass the related activities of systems design and development, data processing, and data communications and provide for evolutionary changes and modifications over the proposed life cycle of each ADP system. Long-range planning should focus on the point in the future where basic directions could be set, major resource requirements categories established, and objectives and investment benefits realized. It should provide management with the life-cycle economic impact for all important investment decisions. To fulfill congressional needs for program approval and to prepare proper agency budgets, 5 years is appropriate for the long-range planning period.

--Short-range plans of annual and lesser duration should identify specific projects, efforts, and functions involved in ADP system design and development. Short-range plans should provide information summarizing all projects, including such overhead functions as management, administrative and support personnel, training, etc., which are essential to maintaining the productive capacity of a system's design and development activity.

--Specific project plans should encompass the life cycle of an ADP system and identify the work required to deliver a system within a specified time frame meeting defined quality characteristics. The projects should be laid out in a time-phased and orderly progression of stages with supporting analyses of work functions and resource requirements, including user organization personnel.

--Annual and more frequent management reviews, including milestone reviews, should compare actual accomplishments with the agency's priorities, goals, and objectives with the assumptions expressed in the long-range and other plans.

All long-range, project, and time-period planning requires financial expression as a common denominator for management decisions and reviews. Appropriate quantitative detail is also needed for reviews, analyses, and other evaluations and for expression of these plans as work plans in operational terms at the supervisory and project management levels.

Interfacing the formal ADP plans with other organizational activities and planning and reporting systems is necessary for coordinating and integrating systems design and development activities within the agency. The formal planning system also should provide for reviews and updates annually and at major milestones to help top management maintain control of systems activities.

Project plans and supporting budgets must have specific measurable accomplishments and should be stated in responsibility-related tasks, phases, and stages with quantitative detail essential to the responsible supervisory personnel and project managers. To be useful in the measurement, identification, and comparison of actual to planned resource consumption and cost, the task, phase, and stage classifications of the plans should be consistent with the management reporting system.

CONGRESSIONAL COMMITTEES, OMB, AND USDA AGREE: EFFECTIVE MANAGEMENT OF RESOURCES REQUIRES A COMPREHENSIVE ADP PLAN

For more than 10 years congressional committees have expressed concern over the lack of comprehensive long-range plans at Federal agencies in the area of information and data processing. For example, in October 1976 the House Committee on Government Operations reported that the failure of Federal agencies to prepare effective long-range plans was a major hindrance to achieving economical procurements, a major objective of the Brooks Act (Public Law 89-306).

The importance of planning is emphasized in Office of Management and Budget Circular A-71. This circular assigns to the heads of Federal agencies the authority and the responsibility for the effective and efficient management of their ADP activities, including planning, coordination, and control of the use of these resources (for example, equipment, software, and personnel). The policy calls for the merger and integration of data requirements, systems, and facilities, irrespective of organizational boundaries of the agency's components, when greater cost effectiveness in resource utilization, data systems management, or program accomplishment can be achieved.

For more than 10 years USDA has recognized the need for a USDA-wide comprehensive ADP planning process. From time to time it attempted to develop an effective planning process, but its efforts fell short as demonstrated by the following chronology.

--In 1970, the Secretary of Agriculture approved the concept of developing an overall ADP plan.

--In 1971, a USDA task force identified actions needed to develop the overall ADP plan.

--In 1975, we reported to the Congress USDA's inefficient procurements caused by poor planning.

--In 1976, USDA prepared an ADP Management Plan. This planning effort was discontinued after 1977.

--In 1977, USDA updated the 1976 ADP Management Plan. This plan primarily consisted of a questionnaire distributed to senior ADP personnel to elicit their thoughts on problems and the direction USDA should take in managing ADP resources. The responses reflected USDA's need for long-range ADP planning.

--In 1979, the Office of Operations and Finance Task Force assessed USDA's data processing requirements for 1978 through 1985. The report recommended formulating an agency and departmental 5-year ADP plan. The task force report and its recommendations were accepted by the Assistant Secretary for Administration.

--In 1979, USDA prepared a draft administrative regulation on the planning process. The draft remained dormant.

--In 1980, Data Services set an objective to develop an ADP planning process. However, it was canceled because other matters were given a higher priority. According to USDA officials, they are redefining what a 5-year ADP plan should include.

WHY DOES USDA DELAY IMPLEMENTING AN ADP PLANNING PROCESS?

USDA and its agencies continue to operate without a comprehensive ADP planning process long after the need for such a planning process was recognized by the Congress, OMB, us, and USDA. Why does USDA permit this condition to persist?

Several factors contribute to the lack of a comprehensive USDA ADP planning process. The important factors follow.

--Neither Data Services nor the agencies have placed a high priority on ADP planning.

--Data Services has not issued guidelines for a comprehensive, long-range ADP planning process.

--Data Services is responsible for helping, instead of monitoring or directing, the agencies in any planning or budget effort.

--Data Services is low in the USDA organizational hierarchy.

--Data Services exercises limited central control because it has little funding authority over agencies.

--Data Services has experienced high management turnover.

Because of the lack of central direction, agencies deferred ADP planning. This void left the USDA computer centers with little basis for their own planning efforts. The lack of Data Services emphasis on the importance of planning was demonstrated by agency ADP officials' comments. For example, one ADP official indicated the central office did not communicate the "expectation" that planning should be performed. Another official, whose agency was developing a plan, felt the central office showed little interest and made unhelpful, limited comments in its review.

Early in 1980 Data Services postponed the development of a planning process and placed higher emphasis on other ADP service responsibilities even though past studies repeatedly recommended ADP planning.

Some agencies see little value in planning. An agency official told the Department that the agency could not "guess" future needs. According to another ADP manager, it is impossible to make long-range plans since congressional actions or economic conditions, such as the unemployment rate, cannot be predicted. Furthermore, some agency officials stated simply that there is no need for the Department to coordinate agency long-range plans because of diverse agency needs.

Effective ADP planning is dependent on how a department organizes to accomplish the planning function. Data Services is low in the USDA organizational hierarchy. It is important in a decentralized organization that a strong central office be established to accomplish USDA-wide planning. The role, function, and structure of USDA's central ADP management office are covered more completely in chapter 2.

High turnover in management also contributed to the delay of planning efforts. There were four Deputy Directors of Data Services within a 4-year period. Each director approached planning somewhat differently. Data Services and agency officials felt

that the frequently changing leadership, with varying emphasis on planning, contributed to the lack of progress.

PLANNING EFFORTS AT USDA AND SELECTED AGENCIES

Data Services has no structured framework for a comprehensive ADP planning process nor has it issued any procedures or guidance to establish such a process. Existing USDA planning activities are fragmented and essentially short term. These activities are not considered useful by 7 of 11 agency ADP officials that we contacted.

Departmental planning activities

USDA viewed its ADP planning function as involving the following activities.

--Planning is keyed to the OMB Circular A-11 ADP budget, including explanatory notes. 1/

--Data Services works with individual agencies to find solutions to known agency requirements outside the budget process. An example might involve an agency request for minicomputers.

--Information is exchanged through such means as the Resource Exchange Program and the annual ADP Managers Conference.

Most agency ADP officials that we contacted recognized that the above activities do not serve as a useful long-range planning process. They felt that the A-11 budget is not an adequate ADP plan for managers; A-11 ADP budget instructions are unclear and frequently misunderstood; and, furthermore, the budget does not relate ADP costs back to agency programs.

The budget process is an important element in the implementation and feedback portion of the planning process. Through its goals and objectives the budget represents a short-term plan of action; however, successful comprehensive planning requires a more complete, long-range perspective and a more thorough feedback process than an annual budget can provide. The ADP budget is not a surrogate for planning; rather, it is a part of the planning process.

1/OMB Circular No. A-11, "Preparation and Submission of Budget Estimates," includes instructions to the heads of executive departments and establishments relating to the preparation of annual budgets. Section 43 of the circular requires that data be submitted on the acquisition, operation, or use of ADP and telecommunications systems.

Most managers acknowledged that Resource Exchange Program meetings and the annual ADP Managers Conference are useful for exchanging information but were not intended to project or establish long-range requirements.

Planning activities at selected agencies

USDA agencies are not preparing comprehensive, long-range ADP plans except for one smaller agency--the Foreign Agricultural Service--which told us that it uses such a planning process. The Forest Service has also been taking steps to develop an ADP planning process. Planning activities carried out by four USDA agencies are discussed below.

FmHA needs effective, long-range ADP planning

FmHA has not implemented an effective, comprehensive, long-range ADP planning process. We believe the absence of this process contributed significantly to the serious problems FmHA has experienced in developing its Uniform Management Information System. For further discussion of these problems see chapter 3.

FmHA is evaluating various alternatives to developing an automated accounting and information system. Before it pursues any alternative, FmHA needs to implement a comprehensive, long-range ADP planning process that identifies its long-range goals, objectives, and priorities. This is essential to ensure that the alternative selected is consistent with FmHA's long-range mission needs.

NFC planning deficiencies

NFC'S ineffective long-range software planning efforts described in chapter 3 have led to unrealistic commitments, less effective project management, and limited hardware planning. While improvements were recently brought about by greater emphasis on planning, a systematic approach is needed to assure that benefits are realized.

Earlier NFC plans were of little value to decisionmakers because of the limited information they provided. The responsibility for preparing these documents had not been consistently assigned to any one organization or individual. These documents generally showed only the estimated completion dates, lacking resource estimates or any mention of relative priorities.

For example, a May 1979 plan indicated that during that fiscal year, the same programing staff would have to perform maintenance, which reportedly accounted for more than half of their time, and complete several major software projects. As shown in chapter 3, at least some of these projects suffered slippages which can be

partially attributed to overcommitted staff. Comprehensive planning would have required setting project priorities and committing available resources only to those projects which could reasonably be accomplished.

Complying with a fiscal year 1980 O&F requirement, NFC began preparing a 5-year plan showing software projects, ongoing activities, and estimated staff-year requirements. However, we found similar deficiencies which reduce the plan's value to decisionmakers and external planners. For example:

--The completion dates for certain software projects differ sharply with dates shown in important concurrent documents prepared for other purposes.

--Priorities are not shown.

--Staff-year estimates shown in the 5-year plan are generally undocumented, questioned by responsible officials, and/or confused by the arbitrary assignment of overhead.

Hardware planning efforts were limited to what was necessary for budgeting and developing procurement documents. NFC has made no documented, systematic attempt to forecast long-range ADP equipment needs, based on current software plans. We were told that prior procurement studies prepared in 1977 containing workload analysis had satisfied this need. However, such documentation is outdated considering NFC's changing development plans and slippages in software projects. NFC needs a coordinated program to periodically assess its future hardware needs based on a documented, up-to-date, long-range software plan with established priorities and target dates.

Forest Service ADP planning efforts

The Forest Service has recognized the need for an effective, comprehensive, long-range ADP planning process and has taken positive steps to bring it about. An important Forest Service planning effort was the Systems Development Action Planning Team Report, published in December 1975. The report cited three major problems regarding the use of ADP to achieve agency goals. These problems were (1) lack of a framework for developing and managing systems, (2) lack of organizational capability to handle changing job demands and technology, and (3) lack of dynamic implementation of a management information system.

The report made several recommendations to solve these problems. Two significant recommendations were to adopt a policy of distributed computing and to restructure the Washington office. The restructuring dealt with strengthening the agency's systems management by organizing to reflect three groupings of systems activities (data management, computer technology, and computer applications), by establishing systems coordinators in the major program areas, and by forming a systems coordinating

council. Forest Service has accomplished the restructuring of its ADP organization, but it is still working on establishing a distributed processing network.

In mid-1979 the Forest Service established the Systems Planning Office to define and implement a national strategic planning process. In February 1980 the Systems Planning Office published the National Systems Management Plan to guide the Forest Service's systems management efforts. The Forest Service also contracted for planning studies in September 1979 to (1) survey external systems management, (2) examine systems staff and Forest Service management planning requirements, (3) analyze strategic planning, (4) analyze planning systems approaches, and (5) develop procedures and guidelines for a Forest Service system planning process.

The Forest Service has begun to develop long-range ADP plans. The Chief of the Forest Service has directed that each region, area, and station develop a unit systems management plan and a unit facilities plan. The management plan will provide an estimate of processing needs to support future programs. The facilities plan is a 5-year plan which states specific methods, especially procurements, for meeting ADP objectives.

ASCS needs a comprehensive, long-range ADP planning process

Although ASCS has not developed a comprehensive, long-range ADP planning process, it recognizes that such a process could be useful. At the time of our review, ASCS was in the process of developing a long-range ADP plan for the Management Field Office in Kansas City, Missouri. This effort will not produce a comprehensive, long-range plan because other ASCS organizational units involved in ADP are excluded. Examples are the Kansas City Commodity Office and the Aerial Photography Field Office. However, since the Field Office is ASCS' largest ADP user, ASCS' plan, if properly developed, will be a significant start.

The Policy and Planning Staff, located at the ASCS Management Field Office, is responsible for planning for automation of ASCS programs, including developing agency ADP objectives, conducting feasibility studies, monitoring and evaluating, and making impact appraisals. The staff translates ASCS user needs into ADP equipment, communications, and data management requirements.

The staff has not developed any formalized long-range ADP planning outside the OMB Circular A-11 budget process. The budget process addresses only the next 2 fiscal years, except that major computer/telecommunication acquisition plans and staffing requirements are projected in dollars for 5 years. Although this process is of some value, ASCS officials generally agreed that their agency needs more specific, comprehensive, long-range plans that reflect long-term ADP goals, objectives, and priorities.

CONCLUSIONS

USDA and its agencies need a comprehensive planning process to manage their ADP and other information resources more effectively. As we discussed in chapter 2, to effectively implement the Paperwork Reduction Act, USDA will have to develop a comprehensive planning process that includes not only ADP but other information management activities.

Because of poor planning, USDA frequently uses inefficient and outdated ADP systems in managing multibillion-dollar assets and in carrying out its programs. Although the impact of using inefficient ADP systems is not measured, we identified millions of dollars in cost overruns for system implementation and delays in converting ADP systems to modern equipment.

Congressional committees, OMB, and USDA agree that effective management of Department and agency ADP resources requires a comprehensive ADP planning process. Although they have initiated some actions to develop an acceptable planning process, we believe that USDA and its agencies have not placed sufficient emphasis on developing this process.

RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

We recommend that the Secretary of Agriculture direct the senior official designated under the Paperwork Reduction Act to

--develop USDA-wide guidelines for a comprehensive IRM planning process and

--direct the agencies to adapt their planning processes to guidelines developed by the senior official.

CHAPTER 7

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of our review was to evaluate the effectiveness of the Department's central ADP management structure in supporting USDA's mission and programs. We accomplished this objective by evaluating how USDA's central management structure ensured that major ADP management functions such as the following were adequately performed by USDA agencies:

1. Planning and forecasting requirements.

2. Measuring and evaluating performance.

3. Procuring computer equipment.

4. Providing satisfactory service to ADP users.

5. Protecting facilities and data (security).

6. Managing and developing software.

Because the chairman's request granted us broad leeway in carrying out the review, we obtained concurrence from his office that the above audit approach would be responsive to the needs of the committee. Our field work was carried out during calendar year 1980 and generally covered conditions existing in USDA during that period although we did analyze ADP developments occurring in USDA during the 1970s.

Near the completion of our audit work, the Congress enacted the Paperwork Reduction Act of 1980. Because the act has a direct impact on how an agency manages its ADP and other information resources, we evaluated how the act should be implemented in USDA. Although our work was primarily directed at USDA's ADP management, we did review our past reports dealing with other information management issues at USDA, such as records management and paperwork management. These reports are discussed in chapter 2.

As criteria in judging how well the above functions were being carried out, we took the position that the management principles and practices applicable to non-ADP activities, programs, and functions are applicable in the main to ADP activities. For example, just as planning, control, direction, and accountability are critical to effectively managing a Government program, we believe they are also critical to effectively managing ADP resources and activities.

Since ADP management at USDA is shared between the agencies and the Department's central ADP office in Washington, D.C., our review included work at both the agencies and the central

office. Also, since the central office is responsible for providing policy direction and operating USDA's computer centers, we examined both of these responsibilities.

We selected four USDA agencies for detailed review: the Farmers Home Administration, the Forest Service, the Agricultural Stabilization and Conservation Service, and the National Finance Center. Because FmHA was recently the subject of a thorough examination by us 1/ and by the House Government Operations Committee 2/ regarding FmHA's management of its computer-based UMIS project, we did not feel additional audit work at FmHA was necessary; however, we have considered the results of these reviews in evaluating USDA management. Through discussions with USDA officials, we have kept abreast of the status of the UMIS project.

These agencies were selected because they are four of USDA's largest ADP users and because they represent various management structures, from highly centralized to highly decentralized. The Forest Service delegates responsibility and authority to the lowest feasible level of its organization, which is scattered throughout the country; while at NFC, located in one building in New Orleans, management is centralized and the Director provides close supervision to lower management levels. FmHA and ASCS are similar in that each has a headquarters unit providing policy and direction, a major field unit providing much of the operational management, and about 2,000 State and county offices serving its constituency.

We also performed an evaluation at the three USDA computer centers operated by Data Services and located in Washington, D.C.; Fort Collins, Colorado; and Kansas City, Missouri. These three computer centers provide ADP support for all USDA agencies. In addition, we evaluated the computer center at NFC, which had been operated by the central ADP office until 1977 when it was merged with NFC. We did not visit the St. Louis Computer Center in this review. However, we did visit it during our review of FmHA's UMIS project.

We also considered and relied upon information contained in our and OIG audit reports published during the last several years that discuss ADP management issues at USDA. Besides briefings and informal reports, we identified a briefing to congressional

---

1/"Farmers Home Administration's ADP Development Project--Current Status and Unresolved Problems" (CED-80-67, Feb. 19, 1980).

2/"Management Failures in Developing the Farmers Home Administration's Unified Management Information System," House Report No. 96-1408, Sept. 26, 1980.

staff, 11 of our reports, and 6 OIG reports that were pertinent to our review. These reports and the briefing are listed along with summaries in appendixes I and II. Generally, as part of this review, we did not determine whether the recommendations in our past reports had been implemented because the recommendations were directed at correcting problems with specific projects and procurements. Instead, we analyzed these reports to determine long-standing management problems that remained unresolved and then sought to relate these problems to weaknesses in the ADP management structure. Our intention was to look for ways to treat the basic causes of USDA's continuing ADP deficiencies.

During our review we also

--examined USDA's implementation of policies, procedures, standards, and guidelines established internally and externally by the Office of Management and Budget, the General Services Administration, the National Bureau of Standards, and by us which relate to managing and procuring computer resources;

--conducted random tests of NFC security procedures;

--analyzed plans, studies, and other documents relating to USDA computer resources management;

--interviewed three former officials of USDA's central ADP office;

--interviewed ADP managers at 11 USDA agencies;

--interviewed the head of USDA's central ADP management office and the heads of his four divisions;

--obtained background information on USDA's computer centers by having each center complete answers to a standard list of questions called a "computer installation profile"; and

--obtained written answers from USDA's Assistant Secretary for Administration to our questions on ADP management functions dealing with planning, organization, and control.

Generally USDA and the agencies we reviewed did not have good data on total software costs and costs to develop, operate, and convert individual applications software systems. Therefore, we had to develop estimates of these costs. Explanations of our methodology in developing these estimates are included in chapter 3.

SUMMARY OF OUR REPORTS ON

USDA ADP MANAGEMENT

1975-80

Report number, date, and title	Summary
1. LCD-75-108 (June 3, 1975) "Improved Planning--A Must Before a Department-wide Automatic Data Processing System Is Acquired for the Department of Agriculture"	We reviewed a proposed USDA procurement to obtain equipment for four USDA computer centers. For the four centers, the total cost of the project, including equipment, software, telecommunications, and operating costs over an 8-year period, was estimated by us at $398 million. We found that USDA had not made the detailed plans or studies that should have preceded procurement. Specifically, USDA did not (1) adequately analyze user requirements, (2) adequately consider security requirements to protect sensitive information, and (3) make economic studies to evaluate the project's benefits and the costs of alternative designs. We recommended that the proposed procurement be canceled and analyses be made to select the best alternative for meeting USDA requirements.
2. LCD-76-120 (Apr. 16, 1976) Letter report on proposed procurement of disk drives by USDA's Washington Computer Center	We found that the Washington Computer Center had not made a study to justify the need to convert from single-density disk drives to double-density disk drives or the need for a mass storage system capable of housing larger data bases. We also noted that although the center had been using one vendor's disk drives, these were also available from another vendor at substantially less cost (about $339,000 annually). USDA accepted our recommendations to cancel the procurement request for double-density disk drives and order the single-density disk drives from the vendor offering lower prices.

Report number, date, and title	Summary
3. LCD-77-101 (Dec. 1, 1976) Letter report on GAO review of USDA plans to replace a computer system at its New Orleans Computer Center	We reviewed USDA's plans to upgrade a computer system on an interim sole-source basis at its New Orleans Computer Center. Our review showed that forecasted shortages in the computer's capacity were not materializing because of modifications and enhancements made to the system. We concluded that there was no immediate need to acquire an upgraded system. USDA agreed with us, suspended the interim acquisition, and proceeded to plan for a competitive acquisition.
4. LCD-76-126 (Dec. 30, 1976) "New Computer Was Not Needed for the St. Louis Computer Center"	We found that procurement of a replacement computer system for the St. Louis Computer Center was not justified because (1) the existing computer had sufficient capacity, (2) projected workload increases were overstated, and (3) improved use of computer resources would have enabled the center to operate without the new computer system until consolidating with the Kansas City Computer Center and implementing a new management information system in fiscal year 1978. Furthermore, we stated that improvements could result in annual savings of over $400,000.
5. LCD-77-115 (June 20, 1977) Letter report on GAO evaluation of allegation by USDA's Washington Computer Center that low-priced disk drives were degrading service	With technical assistance from the Federal Computer Performance Evaluation and Simulation Center (FEDSIM), we reviewed the allegation of USDA's Washington Computer Center that low-priced, competitively acquired disk drives were causing degradation of service. FEDSIM concluded that USDA's allegations were based on a study which used inappropriate statistical methods.

AD-A106 533 GENERAL ACCOUNTING OFFICE WASHINGTON DC COMMUNITY AN--ETC F/G 5/1
DEPARTMENT OF AGRICULTURE NEEDS LEADERSHIP IN MANAGING ITS INFO--ETC(U)
JUN 81
UNCLASSIFIED GAO/CED-81-116 NL

2 OF 2
AD A106 533

END
DATE FILMED
9-81
DTIC

Report number, date, and title	Summary
6. LCD-77-114 (June 23, 1977) Letter report dealing with teleprocessing requirements for FmHA's Unified Management Information System	This report summarizes our involvement to date with certain aspects of FmHA's system development project, the Unified Management Information System. Specifically, FmHA decided to proceed with UMIS without the on-line terminal network that would have included terminals in every county office and agreed to accept certain safeguards, suggested by the Chairman of the House Government Operations Committee, that would help ensure the successful development of UMIS.
7. LCD-77-104 (July 1, 1977) Letter report on GAO review of a sole-source procurement by USDA's Fort Collins Computer Center	In July 1976 USDA acquired a central processing unit on a sole-source basis to replace a smaller system at its Fort Collins Computer Center. We concluded that better planning would have allowed the center to operate with the smaller system until a competitive procurement could have been completed. We found that the Forest Service was transferring its data processing workload to the center without regard to the capacity of the smaller system and without cost analyses to determine what part of its workload could be most economically transferred. USDA agreed with the facts presented in the report.
8. LCD-77-118 (Dec. 23, 1977) "Cooperative Actions Result in More Economical Computer Acquisition and Improved Security at the New Orleans Computer Center"	We found that USDA was remiss in not following prescribed procedures for acquiring a computer system which was needed at its New Orleans Computer Center. However, the agency's cooperation with us enabled the acquisition to proceed with resultant savings to the Government of about $7.5 million. The cooperation also helped to establish a new software conversion method. In addition, USDA began to correct security deficiencies noted in our review. We recommended that the center's security program be reevaluated to ensure that the controls needed to safeguard personal data and financial operations

Report number, date, and title	Summary
	are planned for use when the system becomes fully operational.
9. CED-78-68 (Feb. 27, 1978) "Farmers Home Administration Needs To Better Plan, Direct, Develop, and Control Its Computer-Based Unified Management Information System"	The Unified Management Information System is a computer-based information system under development by the Farmers Home Administration. This new system is designed to deliver better management information to all offices and levels within the agency. It is also intended to improve service to rural Americans seeking financial assistance. Our recommendations made in this report were intended to help the agency more effectively --schedule resources and completion dates, --monitor life-cycle costs for developing and operating the system, --plan and develop the system consistent with user needs, --develop test plans for the two system alternatives, --evaluate the impact of organizational changes on the system, and --exercise top management control.
10. (Oct. 12, 1979) GAO briefing to staff of House Government Operations Committee dealing with ADP management issues at USDA's National Finance Center (no formal written report was requested)	In response to the committee's request, we conducted a review of two major management issues at NFC. The issues focused on the consequences of not completing (1) the redesign of USDA's computerized payroll system and (2) the conversion of USDA's computerized application software. We presented the following consequences which resulted from USDA's management deficiencies associated with missed completion dates of critical ADP projects: (1) additional costs to retain old computers, (2) costs to acquire additional computer equipment or capacity, and (3) delayed benefits to users. We concurred with NFC's plans to acquire an old computer at

Report number, date, and title	Summary
	minimal cost for backup during the redesign period instead of a more capacious computer. Subsequently, NFC procured the old computer.
11. CED-80-67 (Feb. 19, 1980) "Farmers Home Administration's ADP Development Project--Current Status and Unresolved Problems"	In 1974 the Farmers Home Administration began developing a new computer-based information system. In this report, we disclosed that the Unified Management Information System project was suffering from poor planning and management. It was at least 5 years behind schedule, and the development cost for UMIS or its alternative may reach $42 million. Furthermore, the cost to operate the system, as designed, may prove to be excessive, and it may not meet the basic needs it was intended to fulfill. We concluded that UMIS, as currently designed, was no longer a viable approach to meeting FmHA's information needs. The agency was studying alternatives to the system. We recommended that before making a final decision, the agency should first determine its information needs. We also recommended that in developing a new system, the agency improve its project management and increase the level of involvement by top management.
12. CED-81-15 (Oct. 23, 1980) "Forest Service's Region 5 Should Consider Less Costly Ways To Meet Word and Data Processing Needs"	In 1979 the Forest Service's region 5 leased advanced word-processing equipment with communications and data processing capabilities. Although the region was benefiting from the equipment, we found the procurement to be unnecessarily costly. The Forest Service agreed with our recommendations that the region conduct (1) a review to measure the equipment's cost effectiveness and (2) an economic analysis of ways to meet the region's requirements but at a lower cost.

SUMMARY OF MAJOR OIG REPORTS ON USDA ADP MANAGEMENT 1975-81

Report number, date, and title	Summary
1. System Development Advisory Memorandums on FmHA's UMIS project (May 1976 to June 1978)	USDA's OIG has provided in-depth reviews of the entire UMIS effort from its inception in 1975. From May 1976 to June 1978 the OIG issued 24 system development advisory memorandums intended as informal reports on UMIS problems for FmHA management action.
2. Audit Report No. 19602-1-Hy: (Dec. 19, 1977) "Audit of ADS, Office of the Assistant Director for Operations"	This report covers an audit of the office of the Assistant Director for Operations within the Office of Automated Data Systems (ADS). The report noted that ADS officials believe they do not have authority to control development of agencies' ADP applications, which would affect the equipment efficiency at the USDA computer centers. Therefore, agencies are not required to use available tools and services which would increase the efficiency of their ADP operations. Only two of nine agencies contacted had used available tools and services. The ADS Director believed his office should provide ADP standards, guidelines, and instructions to agencies. However, he stated that it was an internal audit function to determine whether agencies implemented and complied with ADP standards, guidelines, and instructions. The report stated that the OIG believes ADS has the authority to require all agencies to use various available tools and services. Regarding ADP procurement planning, the report also found that ADS (1) had not developed procedures to determine whether agency workload projections were reasonable and (2) did not review agency

Report number, date, and title	Summary
	ADP applications to determine whether they were compatible with USDA computer center equipment and were cost justified. ADS accepted workload projections and justification at face value because it did not believe that it had the authority to question these matters.
3. Audit Report No. 19605-1-Hy: (May 8, 1978) "Management and Utilization of Minicomputers in USDA, Washington, D.C."	The OIG found that since the USDA central ADP office did not have formalized procedures for reviewing agencies' requests for technical approval to procure minicomputers, the office routinely granted technical approval without assurance that the requested equipment was viable and necessary. In one agency, a $287,000 minicomputer system was purchased even though the agency did not submit a requirements analysis to the central ADP office depicting the size of the minicomputer required. Consequently, the central processor was used only 26 percent of its available time and most of the peripheral equipment costing $89,000 was not in use at the time of the audit.
4. Audit report No. 50530-4-Hd: (Oct. 13, 1978) "Review of ADP Security Procedures and Controls: Washington Computer Center (WCC) and User Agencies"	The OIG inquiry established that during a 1-year period (Apr. 1977-Mar. 1978) some USDA employees made about 5,700 unauthorized accesses to computer files belonging to WCC, 23 user agencies, and two outside agencies. During this same 1-year period, employees of 15 USDA user agencies made about 700 unauthorized accesses to computer files used solely by WCC to manage and operate its computer system. Although no evidence of large dollar losses was found, the report stated that a very real potential exists for large dollar losses, damage to agencies' operations, lawsuits, and embarrassment to the Department. The inquiry showed that most of USDA's ADP security weaknesses resulted from

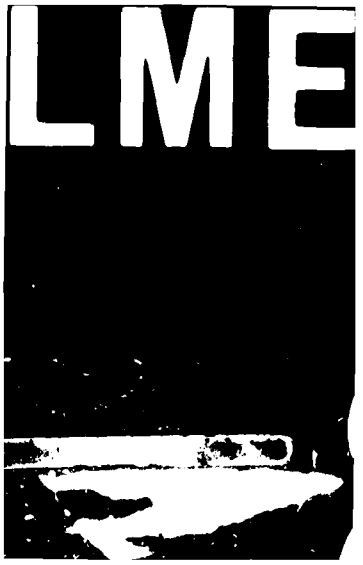
Report number, date, and title	Summary
	(1) a general lack of management concern and emphasis on computer security, (2) poor computer security procedures and practices at WCC and among user agencies, and (3) WCC and user agency noncompliance with USDA's existing security standards and guidelines. Further, there was no central management organization with day-to-day responsibility and authority for monitoring and enforcing USDA computer security procedures and standards among the agencies. The report concluded that top management emphasis on the seriousness of ADP security is needed.
5. Audit report No. 50530-6-Hq: (Feb. 20, 1980) "Audit of a Food and Nutrition Service (FNS) Proposal to Procure External Data Processing Services"	The report concluded that FNS did not follow USDA procedures when working up its proposal to procure external data processing services at an estimated annual cost of $175,000 to support the Child Nutrition Program payment systems and program accounting system.
6. Audit Report No. 50639-1-Hq: (Sept. 17, 1980) "Review of ADP Security and Controls: Washington Computer Center and User Agencies"	The objective of this audit was to determine the adequacy of security controls provided by the Washington Computer Center and the compliance of its 20 USDA user agencies with such controls. The report noted that security standards and procedures had improved since the last OIG audit of WCC in 1978. There was, however, a need for better internal controls to ensure that new security procedures were understood and implemented by user agencies. Also, WCC does not have a contingency plan for the processing of user agencies' critical systems should a major disruption occur at the center; disaster recovery (backup) tapes containing critical data files were not stored in facilities separate from the main tape library; and users' ADP equipment inventories were not regularly updated to reflect new acquisitions, transfers, and dispositions.

APPENDIX II

Report number, date, and title	Summary
7. Audit report No. 11608-2-Hq: (Jan. 13, 1981) "Management and Security Audit of the Fort Collins Computer Center and User Agencies"	The primary objective of this audit was to determine the adequacy of security provided by the FCCC and the user agencies. The audit found that user agencies were not complying with existing ADP security standards because agency management had not placed a high priority on ADP security. As a result, files valued at approximately $2.25 million and files covered by the Privacy Act of 1974 were inadequately protected. Also, user agencies had not developed contingency plans to identify and prioritize critical application programs and data files in case of a major disaster at FCCC. Although user agencies have estimated losses exceeding $1.2 billion in case of a major disaster at FCCC, the offsite disaster storage facility provided by FCCC was not being used to full advantage by all agencies. Some users responsible for backing up critical files were unaware that offsite storage facilities were available to them. In addition, the FCCC ADP security procedures and controls were not adequate to meet the standards required by the Privacy Act. As a result, user agencies were maintaining Privacy Act data under inadequate security conditions, unauthorized users were not limited in their attempts to access the system, and system access keys were not adequately protected.

(061050)

U. S. GOVERNMENT PRINTING OFFICE : 1981 341-843 :EP


LME