

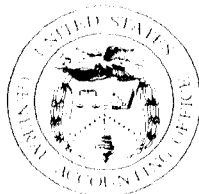
GAO

Report to the Chairman, Subcommittee
on Federal Services, Post Office and
Civil Service, Committee on
Governmental Affairs, U.S. Senate

February 1991

ADP PROCUREMENT

Better Capacity Planning Needed at Agriculture's National Finance Center



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---RELEASED

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**Information Management and
Technology Division**

B-241918

February 13, 1991

The Honorable David Pryor
Chairman, Subcommittee on Federal Services,
Post Office, and Civil Service
Committee on Governmental Affairs
United States Senate

Dear Mr. Chairman:

This report responds to your March 5, 1990, request that we examine issues relating to equipment purchases by the Department of Agriculture's National Finance Center in New Orleans, Louisiana. In a subsequent meeting, your office expressed concern that the Center may be improperly favoring the International Business Machines (IBM) Corporation in its procurements, including improper use of General Service Administration (GSA) schedule contracts.¹ As agreed with your office, we reviewed procurements from IBM to determine whether (1) Agriculture attempted to circumvent the competitive procurement process in the acquisition of automated data processing equipment for the Center, and (2) the Center is procuring automated data processing equipment that exceeds its needs, then entering into cross-servicing agreements with other federal agencies to use this excess capacity. Details of our objectives, scope, and methodology appear in appendix I.

Results in Brief

In the 4-1/2 fiscal years ending in March 1990, Agriculture procured \$51.3 million in automated data processing equipment for the Center. About half this amount—\$26.2 million—was for two contracts with IBM, one for mainframe computers and one for storage devices. An additional \$900,000 was spent for 59 orders of IBM equipment from the GSA schedule.

Agriculture complied with federal regulations in awarding the mainframe and storage device contracts to IBM. We did not identify any requirements in the requests for proposals for either contract that would have unnecessarily restricted competition, and the evaluation

¹Procuring computer equipment from GSA schedule contracts is a method by which federal agencies competitively procure small orders. GSA and the vendor establish maximum order limitations and scheduled prices. Agencies have blanket delegation of procurement authority to order from the GSA schedule, provided that for each purchase they stay within the established maximum order limitations and dollar amount.

factors that Agriculture applied were in accordance with federal regulations. In addition, in competition for both contracts, IBM was the low offeror. However, in 1988 the Center failed to aggregate several procurements of IBM equipment from the GSA schedule amounting to \$163,600, thereby avoiding a requirement that orders from the GSA schedule exceeding \$50,000 be advertised in the Commerce Business Daily.

No evidence was found that the Center was deliberately buying excess equipment and then seeking customers to use the extra capacity. However, one of the Center's two mainframe computer systems has been underutilized since December 1989, when the Center most recently upgraded the system to add more capacity. The Center's justifications for the purchase and subsequent upgrade of its mainframe computer systems were not well substantiated; strengthening the Center's capacity planning process would help assure that its computer resource requirements can be more accurately projected. Center officials believe that use of the underutilized system will improve in fiscal year 1991 due to expansion of its existing cross-servicing agreements with other agencies and development of an Agriculture program to integrate the department's administrative systems.

This report recommends that the Secretary of Agriculture defer additional acquisitions of automated data processing equipment until the Center implements an effective capacity planning program.

Background

The National Finance Center is a unit of Agriculture's Office of Financial Management. The Center maintains the central accounting office for Agriculture and provides accounting services to many other federal entities. The Center's mission is to design, develop, and operate data processing systems that provide automated payroll and personnel processing, administrative payments, billings and collections, accounting, and property and inventory management for all Agriculture agencies. Since 1983 the Center has also provided many of its services to other government agencies through cross-servicing agreements; since 1987 it has been the recordkeeper for the governmentwide Thrift Savings Plan, a component of the Federal Employees' Retirement System. The Center's operations are funded by a working capital fund in which operating revenues are provided by Agriculture and other government entities that receive Center services. In fiscal year 1990 about 34 percent of the Center's \$74 million operating budget was provided by non-Agriculture agencies through cross-servicing agreements. In addition,

equipment for the Center is purchased from a capital budget administered by Agriculture headquarters. This fund totalled about \$8 million for fiscal year 1990.

According to a Center official, from early 1987 to late 1988 Agriculture actively marketed the Center's services to other federal agencies. Beginning in November 1988 Agriculture ended active marketing efforts, however, new cross-servicing agreements were being entertained on a case-by-case basis. In January 1990 Agriculture decided not to enter into any new cross-servicing agreements because it wanted the Center to focus its resources on developing and implementing a system to integrate 40 different administrative systems currently used within Agriculture. A list of agencies receiving service from the Center is provided in appendix II.

Procurements of automated data processing equipment for the Center are generally performed by Agriculture's Procurement Division in Washington, D.C. However, Agriculture has delegated to the Center authority to locally contract for automated data processing equipment and services whose cost does not exceed \$50,000.

Information we obtained from Agriculture shows that during the 4-1/2 fiscal years ending in March 1990, the procurement division made 65 procurements of automated data processing equipment for the Center totalling about \$51.3 million.² Of the 65 procurements, 18, with a value of \$26.8 million (52 percent of the total) were with IBM. Of these 18, 16 were orders from the GSA schedule, and 2 were contracts. The 16 schedule orders had a value of \$572,000 and the 2 contracts—one for replacement of the center's mainframe computers, and one for the acquisition of storage devices—had a combined value of \$26.2 million. In addition, under its local procurement authority, the Center placed 43 orders for equipment and services with IBM under GSA schedule contracts during the 4-1/2 year period. The value of these orders was about \$329,000.

²In some cases the procurement involved more than one customer. Amounts given throughout this report are only for the National Finance Center.

Contract Awards to IBM for Mainframes and Storage Devices Did Not Circumvent Competitive Process

The awards of the mainframe computer and storage device contracts to IBM did not circumvent the competitive procurement process. In both cases multiple vendors submitted proposals, and in both cases IBM was the low offeror. The requests for proposals complied with federal statutes and regulations that require full and open competition. Specifically, the requests for proposals did not contain requirements that unnecessarily restricted competition, and did contain evaluation criteria to allow a fair evaluation of vendors' proposals.

Information on Contract Awards to IBM

Both contracts—for the mainframe and for the storage devices—are multiyear, fixed-price contracts. Three vendors submitted offers in response to the October 1987 request for proposals for mainframe equipment, and four vendors submitted offers in response to the April 1986 request for proposals for storage devices. Both contracts were awarded to IBM, the low offeror, after an initial award to another vendor was protested.

The mainframe contract was first awarded to Amdahl Corporation in May 1988. IBM immediately filed a protest with the General Services Board of Contract Appeals, alleging that Amdahl failed to comply with specifications in the request for proposals, and that Agriculture improperly allowed Amdahl to modify its best and final offer. No formal hearing of the protest was held because all parties agreed that Agriculture would terminate the contract with Amdahl for the convenience of the government, amend the request for proposals, and call for a new round of best and final offers. The three competing vendors provided new best and final offers, and in July 1988 Agriculture awarded a contract to IBM at a considerably lower cost than the original award to Amdahl. The projected total cost of the contract is \$19.5 million.

The mainframe contract has a 6-year life, including options. Under the contract, the Center has purchased two IBM 3090 series mainframe systems. The Center installed the first mainframe, a model 3090-400B with four central processing units, in August 1988. In January 1989 it upgraded the mainframe to a model 3090-600E, which has six central processing units, and in September 1989 upgraded the system again to the even more powerful model 3090-600S. The second mainframe system, a model 3090-300E with three central processing units, was installed in December 1988. It was upgraded in December 1989 to a model 3090-600S.

The contract for storage devices was initially awarded to Vion Corporation in April 1987. Both IBM and Storage Technology Corporation filed protests with the General Services Board of Contract Appeals. The Board agreed with IBM's contention that the data used by Agriculture to evaluate the reliability of Vion's proposed equipment was not meaningful, and with Storage Technology's contention that Agriculture misapplied the evaluation criteria. The Board directed that the contract with Vion be terminated, and that the procurement be reopened. After amending the request for proposals, a second round of proposals was received, and three vendors provided best and final offers.³ As with the mainframe contract, IBM was the low offeror and the award was made at a considerably lower cost than the original award.

The contract for storage devices also has a 6-year life, including options. The equipment is being purchased for Agriculture's National Computer Center in Kansas City, Missouri, and U.S. Navy and U.S. Agency for International Development computer installations in Washington, D.C., in addition to the National Finance Center. The contract is for the acquisition of storage devices that will provide up to 3,810 gigabytes⁴ of storage capacity, of which the Center is to receive up to 953 gigabytes. As of July 1990, the Center had installed equipment that provided 600 gigabytes of storage. The projected total cost of the contract is \$25.8 million, and the cost of equipment to be delivered to the Center under this contract is \$6.7 million.

Technical Specifications Did Not Unnecessarily Restrict Competition

Our review of the requests for proposals for both procurements revealed no requirements that posed an unnecessary restriction on competition. For example, the technical specifications in the requests for proposals did not restrict the kind of equipment to be provided to a specific brand or size that only one vendor could supply. Also, while the technical specifications for mainframes limited the procurement to IBM-compatible computers, Agriculture justified this restriction on the basis of a study that estimated the cost of software conversion to other-than-IBM-compatible computers at almost \$66 million. The storage device request for proposals also limited competition to IBM-compatible devices. Because the storage devices must be interoperable with the mainframes, and because a number of vendors can supply this equipment, the requirement for

³Four proposals were initially received, but one was found by Agriculture to be technically unacceptable.

⁴One gigabyte is one billion bytes. Bytes are typically eight bits. A bit is the smallest unit of data that a computer can process.

IBM-compatible storage equipment in the request for proposals also appears reasonable.

Evaluation Criteria Complied With Federal Acquisition Regulation

The evaluation criteria used by Agriculture in both procurements complied with the Federal Acquisition Regulation. This regulation states that cost shall be included as an evaluation factor and quality shall be addressed in every federal procurement. It also requires the solicitation to clearly state the evaluation factors that will be considered in making the source selection, along with their relative importance.

Agriculture included both cost and quality as evaluation factors in these procurements. The mainframe contract was to be awarded to the vendor whose offer provided the greatest value to the government. The solicitation provided that cost would be more important than technical factors, and consequently weighted the cost factor at 70 percent and technical factors at 30 percent. The storage device contract was to be awarded to the offeror whose proposal offered the lowest overall cost to the government, and the solicitation stated that cost was more important than technical factors. We noted, however, that when GSA granted Agriculture a delegation of procurement authority for the acquisition of storage devices in February 1988, it expressed concern that the solicitation placed greater weight on technical factors rather than cost considerations. GSA recommended that Agriculture review the evaluation and selection factors for this acquisition before proceeding to award. Agriculture amended the solicitation document in response to GSA's concerns.

Some Purchases From the GSA Schedule Were Not Aggregated

In the 4-1/2 fiscal years ending on March 31, 1990, Agriculture placed 16 orders of equipment and services with IBM from the GSA schedule. All but one were for less than \$50,000 and, according to Agriculture, the most recent order was placed over 2 years ago. In addition, under its local procurement authority, the Center placed 43 orders for equipment and services with IBM. All were for less than \$50,000.

The Federal Information Resources Management Regulation requires agencies placing an order from the GSA schedule to summarize the requirements and advertise them in the Commerce Business Daily when the total value of the order exceeds \$50,000. Our review of purchase order logs and files showed that five orders were issued in fiscal year 1988. The Center admits that it did not have procedures in place to aggregate these procurements.

Specifically, we found that on August 8, 1988, the Center issued a procurement request for eight IBM model 3194 H-10 terminals, priced at \$2,200 each for a total of \$17,600. On August 16, 1988, the Center issued another procurement request for 22 more model 3194 H-10 terminals, with a total value of \$48,400. Agriculture's Procurement Division did not notice that these requirements should have been consolidated and, on September 22 and 25, 1988, it placed two separate orders from the GSA schedule for the terminals. In another example, the Center issued three separate orders in April, May, and August 1988 for IBM personal computers with a total value of \$97,575. In August 1990, during preparation for another GAO review, the contracting officer discovered that these three orders should have been combined into one. According to the officer, steps have been taken to increase monitoring of GSA-schedule purchases to ensure that similar requirements are grouped and properly announced. Center officials were also instructed verbally by the contracting officer that such actions are not to recur.

Excess Capacity Acquired Because Needs Were Not Accurately Defined

While the Center has acquired excess computer capacity, we found no evidence that it did so deliberately, then sought out additional customers to use its computers. Rather, the Center acquired excess capacity because it did not have in place an effective capacity planning program, and could not accurately define its mainframe computer resource requirements.

No Evidence That the Center Acquired Excess Capacity to Serve Future Customers

According to a November 1986 feasibility study and a January 1987 requirements analysis supporting the procurement of the mainframe computers, the Center identified a basic requirement for processors with a capacity equivalent to eight IBM model 3084Q processors and an optional requirement for capacity equivalent to four more 3084Qs. The Center justified the basic requirement partly on the expectation that its existing cross-servicing agreements would expand and that substantive ongoing discussions with several other agencies would result in more signed agreements. The requirement for the optional quantity, however, was based partly on possible additional cross-servicing agreements. As of September 1990, the Center had not exercised this option.

In addition, in November 1988 and again in August 1989, the Center prepared narrative summaries to justify upgrading the mainframe computers to add more capacity. Neither of these justifications based the request for additional capacity on unspecified, future customers, but on, among other factors, expansion of existing agreements. For example, the

August 1989 summary stated that the Center expected significant work load growth because of expansion of payroll/personnel processing for Treasury, Justice, and several smaller agencies; enhancement of the Thrift Savings Plan; and development of Agriculture's program to modernize its administrative processes. In addition, according to the Center's computer utilization manager, the Center's desire to take advantage of favorable prices from IBM that were available for a limited time also influenced the decision to upgrade the Center's mainframes.

Improvements Needed in Capacity Planning Processes

Capacity planning assists in forecasting computer resource requirements to ensure that computer capacity exists when needed. The Center does not currently have an adequate capacity planning process, and as a result has acquired capacity in excess of its needs.

Federal Information Resources Management Regulation parts 201-16 and 201-30 require government agencies to conduct capacity management activities in planning, acquiring, and using their computer resources. The regulations require that agencies do short- and long-range acquisition planning, to include:

- analyzing trends in data processing work loads to determine if and when existing system capabilities will be saturated, and
- conducting a comprehensive requirements analysis, including the current and projected work load in terms of data handling or transaction processing by type and volume, to justify the acquisition of additional computer capacity.

Capacity planning supports the procurement process by identifying and justifying system additions and enhancements that will be required both in the near and long term. Capacity planning activities use current system performance data as a starting point to predict future resource needs. Modeling and pilot testing are two activities that can be used in capacity planning to provide data on future requirements and system performance. During the capacity planning process, the total future work load and required user service levels are predicted, resources required to handle the work load and service levels are proposed, planned upgrades are modeled, and the ultimate configuration is defined.

Our review of the January 1987 requirements analysis supporting the mainframe procurement, justifications for subsequent upgrades to the mainframes, and discussions with the Center's computer utilization

manager showed that the Center did not use an adequate capacity planning process to justify its computer processing resource needs. One reason is because it did not have adequate quantitative analysis detailing its future capacity requirements. Center officials also did not employ analytical modeling or other disciplined analytical techniques to forecast future needs. The Center did not use models that could simulate resource requirements in its decisionmaking because it could not describe its work load characteristics with sufficient precision to be able to use the models effectively.

To determine whether an inadequate capacity planning process resulted in the Center acquiring excess capacity, we analyzed the utilization of the Center's mainframe computers. We found that before one of the two mainframes was upgraded in December 1989 to add more capacity, utilization of each of the Center's two mainframes averaged about 60 percent busy during peak weekday hours (between 10 a.m. and 3 p.m.). However, after the upgrade, utilization of the upgraded system fell to about 30 percent during peak weekday hours. Utilization of the system remained low through June 1990.⁵

The Center's computer utilization manager acknowledged that the system was being underutilized in the first 6 months of 1990. The manager said that the implementation of a new data base management system had been delayed, and that the Center failed to fully consider the positive effect on utilization of implementing a new and more efficient operating system for the mainframe computers. The manager also expects peak utilization to be over 60 percent in fiscal year 1991 because of expanded payroll and personnel processing for Treasury and Justice, implementation of the new data base management system, and a growing Thrift Savings Plan work load.

Center officials recognize that improvements are needed in their computer capacity planning processes. The Center is developing a system called the Cost and Production Analysis System, which it believes will allow it to correlate growth in applications such as payroll and personnel processing with computer-resource requirements. The Center's goal is to develop a formal capacity planning methodology in the first quarter of calendar year 1991.

⁵Although many factors influence measures of computer utilization and there is no ideal utilization rate, some experts believe that, as a rule of thumb, mainframes that are busy 60 to 80 percent of the time are being effectively utilized.

Conclusions

Agriculture did not circumvent the competitive procurement process in awarding major automated data processing equipment contracts to IBM. However, because monitoring of GSA schedule purchases was insufficient, some of the procurements of IBM equipment from the GSA schedule were not aggregated. As a result, Agriculture did not advertise these procurements in the Commerce Business Daily.

Although the Center currently has excess mainframe computer capacity, we found no evidence that the Center deliberately procured excess capacity in order to serve additional customers. However, the Center's current capacity planning processes are inadequate to properly forecast resource requirements. Because the Center did not have adequate capacity planning in place, its acquisition of additional processing capability was based on poorly substantiated requirements. This resulted in the Center's acquiring additional computer capacity before it was needed. The Center is taking steps to improve its planning processes, but until it develops and implements an adequate capacity planning and management system, it cannot be sure if it is spending its resources wisely.

Recommendation

In order to ensure that early acquisition of unneeded computer capacity does not take place, we **recommend** that the Secretary of Agriculture defer the acquisition of additional processing capability for the National Finance Center until it has implemented an effective capacity management and planning program, as defined by the Federal Information Management Regulation parts 201-16 and 201-30, and that all future acquisitions include adequate supporting data.

Agency Comments and Our Evaluation

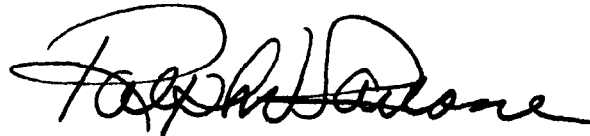
In its December 20, 1990, comments on our report, Agriculture agreed that improvements are needed in the Center's capacity planning processes, and listed several actions that are being taken to improve capacity planning at the Center. The Department also stated that it has taken actions to ensure that future procurement orders from the GSA schedule will be properly aggregated. We believe that these actions will be effective if properly implemented.

Although it generally agreed with our conclusions and recommendation, in its comments Agriculture discussed several factors that it believes supported upgrading the mainframe computers in December 1989. Detailed Department of Agriculture comments and our evaluation are contained in appendix III.

As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the date of this letter. At that time, we will send copies to the Secretary of Agriculture and other interested parties, and will make copies available to others upon request.

This report was prepared under the direction of Howard G. Rhile, Director, General Government Information Systems, who can be reached at (202) 275-3455. Major contributors are listed in appendix IV.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Ralph V. Carlone". The signature is fluid and cursive, with a large initial "R" and "C".

Ralph V. Carlone
Assistant Comptroller General

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Abbreviations

ADP	Automated Data Processing
GAO	General Accounting Office
GSA	General Services Administration
IBM	International Business Machines
IMTEC	Information Management and Technology Division
NFC	National Finance Center

Objectives, Scope, and Methodology

Our objectives were to determine whether (1) Agriculture attempted to circumvent the competitive procurement process in the acquisition of automated data processing equipment for the National Finance Center, and (2) the Center procured automated data processing equipment in excess of its needs, then entered into cross-servicing agreements with other federal agencies in an attempt to use the excess capacity.

To accomplish these objectives, we obtained information from Agriculture concerning procurements of automated data processing equipment for the Center between the beginning of fiscal year 1986 and March 30, 1990, and reviewed documents such as requirements analyses, feasibility studies, software compatibility studies, and contracts relating to the Center's procurements of mainframes and storage devices from IBM. We also reviewed the Center's utilization statistics covering the period from January 1988 to June 1990, and using commercially available capacity modeling software, analyzed the center's work load and performance data for the week of June 18-24, 1989, to determine the extent to which the Center's mainframe computers were being utilized. Center officials told us that these data were representative of the Center's work load processing at the time the last decision was made to upgrade the mainframes. We also interviewed Agriculture contracting officials and Center officials responsible for planning procurements of automated data processing equipment, and for managing the utilization of computer resources.

We performed our work at Agriculture headquarters in Washington, D.C., and at the National Finance Center in New Orleans, Louisiana. We carried out our work between May and September 1990, in accordance with generally accepted government auditing standards.

U.S. Department of Agriculture's National Finance Center Cross-servicing Agreements as of July 1990

Agency	Full Service	Payroll/ Personnel
Department of Education		
Merit Systems Protection Board	x	
Office of the Special Counsel	x	
Federal Mine Safety & Health Review Commission		x
U.S. Information Agency		
Department Commerce		x
Appalachian Regional Commission		x
Federal Deposit Insurance Corporation		x
Federal Retirement Thrift Investment Board		
Department of State		
ACTION		x
Smithsonian Institution		x
Commission on Civil Rights	x	
National Endowment for the Arts		x
Farm Credit System Assistance Board	x	
Housing and Urban Development		x
National Park Service		
General Accounting Office		x
OSHA Review Commission	x	
Commission for Security & Cooperation in Europe		x
Joint Financial Management Improvement Program		x
Department of the Treasury		x
Court of Veterans Appeals	x	
Office of Government Ethics	x	
Small Business Administration		x
Federal Emergency Management Agency		x
National Gallery of Art		x
Federal Communications Commission		x
Farm Credit Administration		x
Library of Congress		x
Congressional Budget Office		x
Office of Technology Assessment		x
Copyright Royalty Tribunal		x
John C. Stennis Center		x
National Labor Relations Board		x
Department of Justice		x
Architect of the Capitol		x
Botanical Gardens		x

**Appendix II
U.S. Department of Agriculture's National
Finance Center Cross-servicing Agreements
as of July 1990**

Administrative Payments and Billings	Administrative Billings and Collection Inquiry	Travel	Management Information Services	Beginning Date Implemented
x	x			11/83
				10/84
				10/84
				01/86
			x	10/86
	x		x	12/86
				12/86
	x	x		04/87
				04/87
		x		04/87
				06/87
	x			10/87
				10/87
				12/87
				02/88
				04/88
			x	08/88
	x		x	10/88
				10/88
				10/88
				10/88
				10/89
				10/89
				10/89
				10/89
				10/89
				10/89
x				04/90
				04/90
				07/90
				07/90
				07/90
				07/90
				07/90
				07/90
				05/91
				07/91
				10/91
				10/91

Comments From the Department of Agriculture

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



DEPARTMENT OF AGRICULTURE
OFFICE OF ASSISTANT SECRETARY FOR ADMINISTRATION
WASHINGTON, D.C. 20250

DEC 20 1990

Mr. Ralph V. Carlone
Assistant Comptroller General
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Carlone:

This is in response to your letter of November 21, 1990, transmitting the draft report entitled "ADP PROCUREMENT: Better Capacity Planning Needed at Agriculture's National Finance Center," GAO/IMTEC-91-14. The Department's comments on the draft report are enclosed.

Sincerely,

A handwritten signature in cursive script that reads "Adis M. Vila".

Adis M. Vila
Assistant Secretary
for Administration

Enclosure

AN EQUAL OPPORTUNITY EMPLOYER

USDA Comments on GAO Draft Report
"ADP PROCUREMENT: Better Capacity Planning
Needed at Agriculture's National Finance Center"
IMTEC-91-14

General Comments

We are pleased GAO reported that: contract awards to IBM did not circumvent competitive processes; technical specifications did not unnecessarily restrict competition; evaluation criteria complied with Federal Acquisition Regulations; and there was no evidence that the Office of Finance and Management's (OFM) National Finance Center (Center) acquired excess capacity to serve future users.

GAO Concern: Purchases from the GSA schedule were not aggregated.

USDA Comments: The Center placed the five orders cited in the report in response to five separate requests from different divisions within the Center. The segregation of orders was the result of meeting those discrete requests and was not intended to circumvent procurement regulations. However, USDA implemented actions to ensure that future orders will be aggregated. These actions include the following:

- the Center established a central point of control and review of procurements, and
- the Office of Operations' procurement personnel conducted training for Center personnel on procurement regulations.

GAO Concern: Excess capacity was acquired because needs were not accurately defined.

USDA Comments: OFM did acquire an upgrade to the Center's computer configuration in December 1989 that resulted in excess capacity for a period of time in FY 1990. However, at the time of the acquisition, new application development initiatives and workload growth estimates indicated that the Center required the increased capacity before the end of FY 1990.

Following the upgrade, the Center installed the latest release of the operating system (ESA). Estimates for performance improvement for ESA were as high as 22 percent. The translation of the ESA performance enhancement estimates into a realized capacity increase could not be accomplished until tested in the specific Center workload environment. ESA did deliver a substantial effective capacity improvement. This had the effect of decreasing the percentage of time the processors were busy, thereby increasing the capacity of the computers. The capacity increase attributable to ESA accounts for the excess capacity observed during FY 1990.

Utilization has increased during the months following the audit review to a level which is consistent with original projections of late FY 1989. As of

See comment 1.

**Appendix III
Comments From the Department
of Agriculture**

See comment 2.

October 1990, the utilization of the configuration averaged over 60 percent busy during prime hours of operation, with peaks of short duration near 100 percent. Presently, the level of available capacity is not considered excessive, and the mainframes are being effectively utilized.

Additional reasons for upgrading the Center's configuration follow:

1. The Center achieved a significant reduction in the overall system life cost of computing capacity. It was economically advantageous to the Government to upgrade in December 1989 rather than to defer the procurement to the latter part of FY 1990. The discount the Center received represented a 68 percent savings from the GSA schedule, amounting to \$7.4 million. This offer was available to the Department only through December 31, 1989. After that date, the S-model upgrade would no longer be available from the vendor. Delaying the upgrade would also require the Government to procure a newer technology, J-model, with little capacity advantage and would have cost the Government over \$2 million or nearly 60 percent more than cost of the S-model upgrade. Although a temporary excess computing capacity existed during FY 1990, the early acquisition substantially reduced overall system life costs.
2. The Center required fully redundant computer systems to provide stable and reliable administrative support services. The Center provides critical services for the Federal Government. The Center services over a quarter of a million Payroll/Personnel accounts, is the record-keeper for the Thrift Savings Plan, and provides online data access to over 10,000 remote users. Computer downtime not only affects the Center, but the entire Government. At the time of the December 1989 upgrade, the Center had an unbalanced configuration of mainframes. The larger machine accommodated the critical production applications and the remote users. The smaller machine was not capable of supporting the critical workload from the production environment. The upgrade of the smaller machine to the same capacity as the larger machine provided needed backup for the critical applications.

See comment 3.

GAO Concern: Improvements needed in capacity planning processes.

USDA Comments: OFM recognizes the need to improve computer capacity planning procedures. The Center has taken progressive actions, such as:

- Developing a methodology for identification and tracking of business forecast units and for integration with computer resource utilization data.
- Establishing a capacity planning base that meets Federal Information Resources Management Regulations.
- Acquiring and implementing industry accepted computer workload simulation/analytical modeling software tools.

**Appendix III
Comments From the Department
of Agriculture**

- Increasing staff support for computer performance evaluation and capacity planning.

In FY 1990, the Center put forth a concentrated effort to improve its capacity planning process. As a result, the Center established an effective base for a sophisticated capacity planning capability.

GAO Recommendation: In order to ensure that early acquisition of unneeded computer capacity does not take place, we recommend that the Secretary of Agriculture defer the acquisition of additional processing capability for the National Finance Center until it has implemented an effective capacity management and planning program, as defined by the Federal Information Management Regulation parts 201-16 and 201-30, and that all future acquisitions include convincing supporting data.

USDA Comments: We concur with the recommendation. The Office of Finance and Management has taken initial steps to establish an effective capacity planning process and will review the process to ensure that it meets the requirements of the Federal Information Management Regulations.

GAO Comments

The following are GAO's comments on the Department of Agriculture's letter dated December 20, 1990:

1. We do not agree that the effect of the new operating system on capacity could not have been predicted. In October 1988 IBM informed the Center that a capacity increase of up to 10 percent could be expected upon installation of the new operating system. However, we found no evidence that the Center considered this in its decision to acquire the upgrade.
2. Based on additional information provided by the Center, we agree that utilization of the mainframe upgraded in December 1989 has improved, but not to the degree Agriculture stated. Data supplied by Agriculture indicated that utilization of the mainframe in October and November 1990 was actually in the low to middle 50 percent range rather than 60 percent.
3. According to IBM officials, the probability of all the processors failing simultaneously is extremely low. In addition, the upgrade of the machines exceeded what was required to support critical applications. Also, it is not sound practice to have backup equipment colocated in the main data center.

Major Contributors to This Report

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Technology Division,
Washington, D.C.**

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First-Class Mail
Postage & Fees Paid
GAO
Permit No. G100
