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Report to the Chairman, Committee on Government Operations, House of Representatives

April 1987

ADP SYSTEMS

SSA's Modernization Efforts Need Redirection

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Information Management and
Technology Division

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April 10, 1987

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

Dear Mr. Chairman:

This report responds to your February 18, 1986, request that we review the Social Security Administration's Systems Modernization Plan to determine if it should be redirected or cancelled, and to assess the agency's claims that automation improvements can reduce staff We found that although the agency has made some progress, it has not accomplished two key objectives—modernizing software and implementing an integrated data base. In addition, we expressed concerns that the agency may not achieve planned staff reductions because the effects of automation on personnel are uncertain.

This report includes recommendations to the Secretary of Health and Human Services. As you requested, we did not request official agency comments on a draft of this report.

As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of the report until 30 days from its issue date. At that time, we will send copies to the Secretary of Health and Human Services; the Commissioner, Social Security Administration; the Chairman, Senate Committee on Governmental Affairs; the Administrator, General Services Administration; and the Director, Office of Management and Budget.

Sincerely yours,

Ralph V. Carlone
Director

Executive Summary

Purpose

The Social Security Administration (SSA) depends heavily on computers to perform its mission: in fiscal year 1986, SSA's computer systems processed about $195 billion in payments to over 40 million beneficiaries In 1982, the agency began a $479 million, 5-year project to modernize its computer systems by March 1987. The Chairman of the House Government Operations Committee, concerned about SSA's systems modernization progress, asked the General Accounting Office (GAO) to answer the following questions:

- Should the modernization plan be cancelled or redirected, and, if so, what alternatives should SSA consider?
- Is there any validity to SSA's assertion that it can reduce staff because of the agency's automation effort?

Background

In 1982, SSA developed the Systems Modernization Plan in an effort to correct difficult-to-maintain, obsolete computer systems that were creating serious service problems. The plan's objectives were to improve software, equipment, and data communications, and to implement an integrated data base in order to provide better service to the public. Congressional appropriations and oversight committees, as well as GAO, generally endorsed SSA's modernization plan.

Results in Brief

SSA has made some progress and improvements by acquiring computer equipment and expanding the data communications network. However, while the agency has spent over $400 million in the past 5 years, it has not met the objectives of modernizing its software and implementing an integrated data base SSA's limited progress in these areas has occurred because it did not (1) follow the 1982 modernization plan's technical strategy, (2) use an agency-wide, long-range plan to guide the modernization effort, and (3) adequately plan, integrate, and manage the effort. Further, SSA's 1987 updated modernization plan does not sufficiently direct future efforts because it does not adequately address the plan's status, current systems deficiencies, and methods for correcting these deficiencies.

The overall effort has proven too large and complex for SSA to carry out—a concern that GAO raised in 1982. Unless SSA revises its modernization approach, it may not solve past problems or achieve anticipated benefits. Consequently, SSA will have to rely on its existing inefficient systems until the 1990s, impeding further improvements to public service.

Furthermore, while SSA has achieved some staff year reductions—one expected benefit of automation—through other efforts, the extent of future reductions from systems modernization is uncertain.

Principal Findings

Technical Strategies Not Followed

SSA did not follow the logical, sequenced, supportable approach set forth in the 1982 plan. The plan focused first on developing standards and improving existing software. These efforts were to provide control and support for redesigning new software. SSA was to use the software improvement and redesign requirements to develop an integrated data base and to determine equipment needs The plan also called for tests of hardware and software configurations for the new system. However, SSA did not effectively follow this approach. (See pp. 9 to 11 and p. 16.)

Instead, SSA shifted its emphasis from establishing software standards and improving existing systems to redesigning a completely new system. As a result, SSA is 3 years behind schedule in defining basic software requirements, and the completion date for redesigning the software and implementing the integrated data base has not been determined. (See pp. 17 to 26.)

Despite these delays, SSA has awarded or plans to award contracts totaling over $190 million for equipment. While certain benefits have been realized through these procurements, the software redesign that would process a large majority of SSA's workload will not be completed until years after the new equipment is installed; thus, the equipment may become obsolete before it can be fully used. (See pp 26 and 27.)

Finally, because SSA has not completed software redesign or installed hardware in test offices as planned, it is not adequately testing systems performance. In the past, inadequate testing has caused system problems, adversely affecting service to the public. (See pp. 27 and 28.)

Modernization Effort Not Guided by a Long-Range Agency Plan

Although SSA recognized as early as 1982 that it needed a long-range plan, it proceeded to modernize its systems without one, contributing to the delays in software development. GAO identified this and other management problems in its general management review of SSA and recommended that SSA develop a long-range operational plan. A

comprehensive, agency-wide, long-range plan would provide the framework to effectively guide the systems modernization activities. In September 1986, SSA established a central planning function to develop such a plan. (See pp. 30 to 32.)

Management Problems Impede Modernization Progress

In 1982, SSA noted that previous systems modernization attempts were unsuccessful because of (1) inadequate planning, managing, and controlling of its systems activities and (2) staffing deficiencies. These same managerial weaknesses have persisted during the first 5 years of the modernization plan, contributing to project delays and uncertainties about the total cost of the entire systems modernization effort. (See pp. 32 to 40.)

1987 Updated Modernization Plan: Inadequate Guide

SSA adopted the modernization plan as a formal document to provide a status of the modernization effort and a plan for future efforts However, because SSA decided not to focus on existing systems' problems, the 1987 updated plan does not adequately describe SSA's software modernization status, current systems' deficiencies, or methods for correcting these deficiencies. Consequently, the 1987 plan does not accurately reflect the risks and costs of completing software projects. (See pp 42 to 46.)

Staff Reductions From Automation Uncertain

In 1985, SSA cited the Claims Modernization Project as a modernization initiative that would reduce over 5,000 staff positions. However, although this project is intended to reduce the workload for individuals who review claims information, SSA obtained insufficient information to quantify the impact on field office staff positions. Also, this project has been delayed. As a result, the extent of staff reductions attributable to this automated effort is uncertain. (See pp. 48 to 51.)

Recommendations

Recommendations to the Secretary of Health and Human Services

As part of its general management review of SSA, GAO made a series of recommendations to improve SSA's overall management as well as the systems modernization efforts. In addition, GAO recommends that the Secretary of Health and Human Services require SSA's Commissioner to

redirect its modernization effort by (1) revising the systems modernization plan to define systems deficiencies and identifying methods for correcting those deficiencies, and (2) reducing the modernization efforts scope to address the most critical systems deficiencies, emphasizing software redesign. SSA should use this focused effort to demonstrate its ability to determine requirements for the total hardware and software configuration.

Additional recommendations appear on pages 53 and 54.

Matters for Consideration by the Congress

The Congress should consider limiting SSA's future ADP appropriations to the maintenance and operation of its current systems and only those critical modernization and improvement initiatives identified in its revised systems modernization plan These limitations should remain in effect until SSA has demonstrated its ability to complete software redesign, has determined its systems configuration requirements, and has had its revised plan reviewed by appropriate committees of the Congress.

Agency Comments

Discussions were held with responsible SSA officials throughout the course of the audit to ensure the accuracy and completeness of the data included in the report. However, GAO did not request official agency comments on a draft of this report.

Contents

Abbreviations

ADP	Automatic Data Processing
GAO	General Accounting Office
HHS	Health and Human Services
ITS	Information Technology Systems
OMB	Office of Management and Budget
SMP	Systems Modernization Plan
SSA	Social Security Administration

Introduction

Social Security Administration (SSA) programs affect millions of wage earners and Social Security beneficiaries. SSA's primary programs are the Retirement, Survivors, and Disability Insurance Program (Retirement Program) and the Supplemental Security Income, Aged, Blind, and Disabled Program (Supplemental Security Income Program). In fiscal year 1987, SSA will pay more than $195 billion to over 40 million beneficiaries. SSA also provides substantial operational support to other government entities administering related programs, such as Medicare. Computerized operations play a critical role in SSA's ability to accomplish its mission

SSA's 1982 System Crisis

Throughout the 1960s, SSA's computer systems served as a model for other users of automatic data processing (ADP) However, during the 1970s, the agency did not keep pace with advances in ADP technology, such as direct access storage devices, larger capacity mainframe computers, and more efficient computer software. Consequently, by the end of the 1970s, SSA reported that its computer systems were close to collapse and unable to process much of the workload; in 1982, the agency said that its systems were obsolete, difficult to maintain, and vulnerable to failure. Systems deficiencies were cited in all aspects of SSA's ADP environment, including both software and hardware

According to SSA, the potential and/or actual consequences of the system's deficiencies included grave risk of failing to pay Social Security benefits, inadequate responsiveness to legislative changes, exposure to the risk of fraud, and poor service to the public. Inadequate hardware capacity caused delays in posting of workers' earnings and in issuing benefit payments. Serious system development and software deficiencies also existed SSA's computer programs had millions of lines of patchwork software. None of these computer programs was fully documented to federal standards, making it very difficult to quickly implement changes to software. This necessitated labor-intensive manual processes and inhibited full utilization of advanced computer processing technology.

SSA stated that many of its systems' deficiencies were caused by recurring management problems. Noting that it had previously attempted to modernize its systems, SSA said these efforts had been unsuccessful primarily because of (1) inadequate management attention, (2) changing priorities, (3) staffing deficiencies, and (4) ineffective planning and control processes.

Systems Modernization Plan—A Proposed Cure

In 1982, SSA proposed a comprehensive 5-year Systems Modernization Plan (SMP), at a cost of approximately $479 million, to provide the strategic direction for improving its data processing systems and restoring excellence to SSA systems. The plan would enable SSA to respond promptly to new legislation and to safeguard funds and personal data. The modernization plan was also intended to speed up routine processing and improve the efficiency of SSA's existing software. In 1982, the Congress approved the plan, and SSA initiated its implementation.

The strategies forming the foundation of SSA's modernization effort were developed to take into consideration previous concerns expressed by the Congress, GAO, and the General Services Administration. Between 1974 and 1982, GAO had issued 32 reports with specific recommendations pertaining to SSA's ADP activities. For example, in March of 1980,[1] we raised concerns over SSA's ability to adequately justify ADP acquisition proposals and to sufficiently address workload projections and alternatives In February 1981,[2] we reported deficiencies in SSA's attempt to redesign its computerized systems. These deficiencies eventually led to the project's being unsuccessful because SSA did not analyze the costs and benefits of the redesign and did not adequately validate major systems changes. Finally, in September of 1981,[3] we reported that the move to the new computer center would do little to alleviate the adverse effects of archaic, undocumented software and insufficient numbers of technically skilled SSA systems personnel.

SMP Represented a New Approach to Modernization

The SMP set forth SSA's long-range, ADP goals, which included restoring excellence to the Social Security Administration's ADP systems by improving (1) the quality and timeliness of data processing, (2) staff effectiveness, and (3) client service. To achieve these goals, SSA emphasized software improvements that would provide the basis for the other SMP components. To preserve the value of SSA's past software investment and avoid the danger of failure inherent in the "tear it down and start anew" approach, the plan called for software improvement to be an

[1] Improving Social Security Administration Procedures for Acquiring ADP and Telecommunications Resources (GAO/HRD-B-164031, March 31, 1980)

[2] Social Security Needs to Better Plan, Develop, and Implement Its Major ADP Systems Redesign Projects (GAO/HRD-81-147, February 6, 1981)

[3] Relocating Social Security's Central Computer Operations Recent Agency Planning and Management Has Been Good, but Further Precautions Should Be Taken To Reduce Risks (GAO/HRD-81-134, September 1, 1981).

integral part of the total SMP. This strategy was different from past SSA approaches that focused on buying more hardware and adding more people, rather than integrating the software and hardware improvements for the system into a single plan. Although computer capacity was recognized as a deficiency that had to be dealt with, the plan did not rely primarily on a hardware solution.

The SMP was divided into three phases—survival, transition, and state-of-the-art—that were to be completed between March 1982 and February 1987. The first and second phases were to be accomplished in consecutive, 18-month periods and the third in the remaining 24 months of the 5-year plan. SSA defined its survival phase as immediate action to improve ADP capability and capacity in order to survive its ADP crisis. In the transition period, SSA was to make the changes necessary to put the agency in a modern data processing environment and pave the way for the final transition to a state-of-the-art operation.

During these phases SSA planned to implement four major programs. Within each of these programs, certain tasks were to be completed in sequence in order to achieve the plan's goals. The four programs were:

- Capacity Upgrade: involving the purchase and installation of new high-speed mainframe computers and associated hardware;
- Software Engineering: encompassing improvements to the existing software and a thorough redesign of SSA's basic software programs;
- Data Communications Utility: constructing a single unified telecommunications network; and
- Data Base Integration: producing the modern integrated data base system necessary to permit a true on-line environment at SSA.

SSA later added two additional programs. In 1983, SSA added the System Operations Management Program to improve data center management, both in SSA's National Computer Center and in the program service centers.[4] In 1984, SSA added the Administrative Management/Information Engineering Program to (1) improve SSA's management information systems, (2) automate administrative functions, and (3) support office automation throughout SSA.

[4]SSA has seven Program Service Centers—Baltimore, Maryland, Birmingham, Alabama; Chicago, Illinois; Kansas City, Missouri, New York City, New York, Philadelphia, Pennsylvania, and Richmond, California—that process, review, and approve retirement, disability, and supplemental security income payments

SSA's 1982 Modernization Approach Supported, but Concerns Raised

In May 1982, GAO reported[5] that the SMP seemed to present a logical, systematic approach for solving SSA's pressing software, hardware, data management, data communications, and general ADP management problems. We supported the plan because it built on existing SSA systems and followed generally accepted systems development and modification standards. Further, the plan called for defining manageable increments of improvements and evolving to a new SSA-beneficiary payment system without jeopardizing service to the public. This was to be accomplished by documenting and improving the current software systems before completely redesigning new software.

While endorsing the 1982 SMP as a necessary first step toward systems modernization, we also warned of the following potential problems:

- SSA had not developed an agency-wide, long-range planning process. We believed that this could prevent SMP from responding adequately to future agency and program needs, and that systems improvements should not only solve current SSA systems problems but also meet long-term agency needs.
- SMP was underestimating the magnitude of corrective actions needed and the time frames and resources required to ensure successful implementation.
- SSA continued to encounter difficulties in hiring highly technical and experienced systems personnel. We felt that SSA needed more highly skilled technical personnel to effectively monitor and direct SMP contractors and prepare SSA for assuming management and control of the new software that these contractors were to develop.

The House Committee on Government Operations reported that it was encouraged by the SSA Commissioner's plan to address the most serious problems facing SSA—software and personnel issues. However, the Committee was concerned that the plan's survival phase was essentially another hardware solution that would, at best, only temporarily delay the continuing deterioration of SSA's computer operations. In its 1982 report[6] on SSA's computer operations, the Committee found, among other things, that SSA had long avoided the decision to redesign its computer

[5]Examination of the Social Security Administration's Systems Modernization Plan (GAO/HRD-82-83, May 28, 1982)

[6]House Report No 97-900, September 30, 1982

software systems, preferring instead to procure sole-source additional hardware capacity.

Objectives, Scope, and Methodology

In February 1986, the Chairman of the House Committee on Government Operations requested a comprehensive review of the Social Security Administration's SMP (see appendix). The Chairman requested the review because of the Committee's concern that SSA's modernization plan was inadequate and might not meet the future requirements of the agency. Specifically, we were requested to determine (1) whether SSA's ongoing and planned computer procurements were fully justified and would meet the needs of the agency, (2) whether the modernization plan should be cancelled or redirected, and if so, determine the most viable alternatives that SSA should consider, and (3) whether there was any validity to SSA's assertion that it could eliminate 17,000 workers as a result of the agency's current automation efforts.

We addressed the first part of the Chairman's request—SSA's hardware procurement justification—in our August 1986 report [7] To complete our response to the Chairman's letter, we focused this review on the second and third parts of the request—the direction of the SMP and the viability of SSA's staff-cuts proposal. In addition, we assessed the overall modernization effort within the context of the agency's management practices.

To assess SSA's changes to the SMP and its progress in meeting the plan's objectives, we

- reviewed the 1982 SMP that outlined the basic strategy for modernizing SSA's software and hardware systems;
- analyzed subsequent updates to the SMP, made in 1983, 1985, 1986, and 1987 to determine: (1) shifts in direction from the original plan, (2) revisions in time frames, and (3) changes in the scope of SMP projects;
- reviewed previous GAO reports on SMP, and identified areas of concern that were recurring: software and data base delays, inadequate hardware justification, management inadequacies, and personnel problems;
- reviewed reports by the Health and Human Services (HHS) Inspector General and the Office of Technology Assessment that analyzed aspects of SMP; and
- examined pertinent federal ADP management regulations and industry standards for the design and development of large computer systems.

[7] ADP Acquisitions SSA Should Limit ADP Procurements Until Further Testing Is Performed (GAO/IMTEC-86-31, August 8, 1986)

To determine the current status of the major SMP projects, we interviewed SSA officials responsible for implementing the four 1982 SMP programs: Software Engineering, Database Integration, Capacity Upgrade, and Data Communications. For each program, we collected and reviewed relevant documents, including Requests for Proposals, contracts, and other supporting material and compared SSA's implementing activities to the original SMP strategy.

With regard to the status and direction of the Software Engineering program, we interviewed officials in the Office of Systems Requirements, the Office of Systems Integration, and the Office of Systems Engineering. We reviewed the structured analysis documents that SSA completed to document its existing programmatic software for adequacy, level of detail, and adherence to accepted systems design practice. Finally, we interviewed contractor staff responsible for developing functional requirements for the largest segment of the software redesign—Program Benefits—and obtained cost figures for contractors involved in developing functional requirements for SSA's software redesign.

To assess the progress and direction of SSA's data base integration program, we interviewed the SSA program managers and the contractor that developed the target data base architecture. We also obtained documents related to the data base design and implementation, including the original Request for Proposals and industry comments.

To determine SSA's progress in upgrading its computer capacity, we interviewed the SSA program managers for the Capacity Upgrade and Data Communications Program to update the findings from our hardware procurement report [8]

To assess SSA's staff reduction program, we reviewed the agency's budget justifications for fiscal years 1986, 1987, and 1988 to determine where reductions were being planned as a result of ADP modernization. We also reviewed other agency documents and memorandums related to planned and actual staff reductions and interviewed key SSA officials in the Field Liaison Support Staff and the Office of Management, Budget, and Personnel. In addition, we compared SSA's automation-related staff-cut proposals with the agency's schedule for implementing beneficiary-related software improvements, because actual cuts will depend on SSA's progress in redesigning software.

[8] ADP Acquisitions SSA Should Limit ADP Procurements Until Further Testing Is Performed (GAO/IMTEC-86-31, August 8, 1986)

Finally, we assessed the overall direction and progress of SSA's modernization effort within the context of its management structure and practices. As part of this effort, we interviewed senior agency officials and discussed the need for organizational change and reviewed reports issued by GAO and other parties, such as the Office of Technology Assessment, which addressed this matter.

We conducted our work at SSA headquarters in Baltimore, Maryland, and in contractors' offices in Alexandria, Virginia, between July 1986 and February 1987.

We sought the opinions of high-ranking SSA officials during the course of our work. However, in accordance with the requester's wishes, we did not obtain the views of these officials on our findings, conclusions, and recommendations; nor did we request official agency comments from HHS. Except as noted above, we performed our work in accordance with generally accepted government auditing standards.

Delays and Changes in Strategies Have Resulted in SSA's Not Achieving Major SMP Objectives

The 1982 SMP set major objectives to be achieved by March 1987. These included (1) improving and redesigning software, (2) instituting an integrated data base, and (3) expanding computer capacity by purchasing mainframe computers and constructing a telecommunications network. The plan called for a careful, sequenced approach to accomplishing these objectives. It focused on improving and redesigning software that was to drive other components of the plan. The plan stated that SSA would first develop and enforce standards and second improve existing software. These critical tasks would provide the control and support for redesigning new software (developing new software to replace the existing software). Then, based on the software improvement and redesign requirements, SSA was to develop an integrated data base and determine the computer capacity requirements to support all of its software. Further, SSA noted in its plan that pilot tests of the hardware and software configurations would be performed in order to ensure that the system would provide consistently correct results. For major systems procurements, the Federal Information Resources Management Regulation requires agencies to assess ADP equipment capability and to validate system performance.

However, SSA did not effectively follow this approach. It shifted its emphasis from first establishing software standards and improving existing systems to undertaking a complete software redesign as a result of inadequate management attention, staff constraints, and an underestimation of the complexity and magnitude of improving the existing software systems. Because of this change in emphasis, the agency has not completed the critical software tasks needed to provide a proper foundation for software systems redesign. Consequently, SSA's major redesign projects have been significantly delayed or cancelled, preventing it from achieving its objective of redesigning and implementing new software. Further, while the agency has made some progress in the data base integration program, the significant delays in defining new software requirements have contributed to the agency's inability to implement an integrated data base.

Despite these delays, SSA has proceeded to procure equipment and expand its computer capacity However, the software that handles the large majority of SSA's workload will not be completed until years after the new equipment is installed. As a result, it is possible that the equipment will become obsolete before it can be fully used. Further, delays in software redesign and difficulties in obtaining new hardware for test offices resulted in inadequate testing for individual projects. In the past,

inadequate testing has caused system problems, adversely affecting service to the public.

Incomplete Software Tasks Contributed to SSA's Not Accomplishing Its Objective of Redesigning New Software

SSA has not followed its initial plan for modernizing its software systems. Instead of first developing and enforcing software standards, then improving its existing software,[1] and finally redesigning its systems, SSA is redesigning its systems before completing the initial two steps. SSA's development of software standards has been delayed as a result of inadequate management attention and staff constraints Many software improvement tasks were delayed because early attempts at improving the existing software were unsuccessful due to its complexity and inadequate documentation.[2] SSA officials also decided, on the basis of an analysis of proposed system functions, that much of the existing software could not be used in the new system Thus, SSA de-emphasized improving the existing software system and delayed critically needed documentation. As a result, SSA made only limited progress in the critical software improvement tasks needed to provide a proper foundation for redesigning new software and experienced difficulties and delays in redesigning new software to replace its existing software systems. SSA is now 3 years behind schedule in defining basic software requirements. Consequently, the agency must continue to use its admittedly inadequate software for a lengthy period—well into the 1990s.

Delays in Completing Software Standards

SSA indicated in its 1982 SMP that the first step to software modernization was developing software standards. Accepted industry practice calls for a standard approach to developing and maintaining software because programmers have many options for designing, coding, testing, and documenting computer programs. Without enforced standard methods, labor costs to maintain systems are higher (because programmers who did not design the programs they are maintaining must spend extra effort to understand them), and it is more difficult to evaluate and control software development.

SSA originally planned to complete its software standards by 1983, but currently projects completion in December 1987. The standards were to

[1] This project was to make technical improvements to software programs for efficiency and maintainability These improvements included documenting systems, upgrading and restructuring software code, and removing unused code

[2] In chapter 3, we discuss these unsuccessful software improvement efforts

cover all phases of systems development and specify management control points between and during each phase. By 1984, SSA had partially developed a standards manual that followed the computer industry's systems development life-cycle methodology and had developed procedures covering all of the life-cycle phases. However, we reviewed[3] the standards in 1985 and found deficiencies, such as incomplete documentation standards for software development. These deficiencies delayed redesign efforts because the standards were unclear. For example, a contractor hired by the agency to develop system specifications had difficulty determining the type of documentation SSA was requiring; consequently, it performed unnecessary documentation efforts. Our 1985 report pointed out that SSA's slow progress in developing software standards was due to insufficient staff assigned to the project during the first three years (from 1982-1984) of SMP and multiple changes in project leadership, which resulted in inadequate management attention.

In 1986, SSA increased management attention and staff to the project and has since been revising its standards. However, standards covering two major phases—installation and testing, and review and audit—remain incomplete. An SSA systems official responsible for major software projects expressed concern over these incomplete standards and told us they may hinder an effective, standardized software redesign because, absent the standards, programmers are developing their own procedures for validating and documenting systems.

Software Improvement Tasks Are Behind Schedule

Improving SSA's existing software was the second step of the software modernization program. Software improvement, which included both documenting and improving the existing software, was needed for the following reasons:

- Documentation would (1) describe what systems actually did for users, thus aiding decisions about the new system; and (2) reduce the labor cost of maintaining the existing systems by making them easier for programmers to understand and less vulnerable to employee turnover.
- Improvement would (1) make it easier to adapt to new user needs, (2) reduce the labor cost of maintenance, (3) make some of the software more usable components of the new system, and (4) reduce the machine costs of operating the software.

[3]Social Security Administration's Computer Systems Modernization Effort May Not Achieve Planned Objectives (GAO/IMTEC-85-16, September 30, 1985)

In September 1985, we reported[4] that SSA's software improvement activities had not taken place as scheduled in the 1982 SMP because of planning and management problems. Furthermore, we noted that SSA had deemphasized the software improvement approach in favor of system redesign efforts, citing difficulties experienced in the initial software improvement efforts and a study showing that much less code could be salvaged than originally expected. We concluded that this new approach was inherently risky because it called for new systems to be designed before completion of important software improvement tasks, such as documentation. Even if the existing software could not be used in a new system, we believed that a fundamental step essential to any redesign effort would have been to first sufficiently document the existing systems' requirements. During our current review we found that while SSA has made efforts to document the existing software, these efforts have been inadequate and several software improvement projects still have not been performed.

Existing Systems Not Adequately Documented

Documentation serves as a baseline for existing systems to support software improvement projects and provide an effective transition to redesigned systems.[5] Proper documentation of an existing system helps ensure that no essential functions are omitted when redesigning a new system and that these functions will operate in the new system properly.

In November 1986, SSA completed a documentation project of major existing software systems, including the Retirement and Supplemental Security Programs. The project's objective was to provide functional descriptions for the software in non-technical terms. We reviewed documentation for 9 of the 66 systems supporting SSA's Retirement Program and found that the documentation does not efficiently and adequately support software improvement projects nor allow new functional requirements for redesigned software to map[6] effectively against existing system functions. Specifically, the documentation

- does not use available technology,
- contains insufficient descriptions of computer processes, and

[4]Social Security Administration's Computer Systems Modernization Effort May Not Achieve Planned Objectives (GAO/IMTEC-85-6, September 30, 1985)

[5]See Federal Information Processing Standards Publication 64 for additional details on documentation guidelines to support the effective design, management, and maintenance of ADP resources.

[6]"Map" means to compare, verify, and validate the new system with the existing system.

- contains data inconsistencies and errors

There are many commercial software packages available that support the preparation, validation, and maintenance of systems documentation These automated software packages help ensure the integrity and consistency of program documentation by detecting naming errors[7] and unmatched data.[8] In addition, the automated software packages provide graphical exhibits and avoid the very time-consuming process of maintaining documentation manually.

In late 1984, SSA acquired a commercial software package to help document software systems. However, SSA felt that the time and effort required to use the package was excessive and therefore did not use it. We found that SSA—3 years later—still has not documented its systems in sufficient detail in accordance with its software standards manual.[9] For example, one major system—Automatic Earnings Recomputation Operation—contains a process description for validating earnings and computing primary insurance amounts[10] that includes:

- "Determines which primary insurance amount computation formula is to be used.
- Selects base years and recomputes primary insurance amount."

In our opinion these statements are not adequate definitions of the system's functions. An analyst attempting to design new requirements would have to conduct extensive research to completely define these processes.

In addition to insufficient detail, SSA's documentation contains data inconsistencies and errors. A structured design document should be internally consistent: all program modules such as data flows, data stores, and processes[11] should not only have unique names, but also have

[7]A naming error occurs when the same data are named differently in two different programs

[8]Unmatched data are created when data are defined as output of system "A" to system "B," but system "B" does not define the data as input

[9]Systems Engineering Technology Manual Part 30, Chapter 20 2 1 3, paragraph 2 5.

[10]The primary insurance amount is used as a base for computing all types of benefits payable on the basis of one individual's earnings record.

[11]"Data flows" means the movement of data between processes, "data stores" refers to where the data are stored between processes, and processes are the part of a software program that changes or manipulates the data

the same names every time they are used. If these conditions do not exist, it is difficult to efficiently develop new functional requirements for redesigned software based on existing system documentation. We found, however, that documentation prepared by SSA does not adhere to these principles. For example:

- The Retirement Program had data flows to and from the Supplemental Security Income Program, and all data flows had different names.
- Within the Retirement Program, we found 5 name variances, 2 instances of omitted data flows, and 43 discrepancies between data flow diagrams and the supporting data flow descriptions.

A key agency official indicated that inadequate documentation contributed to the significant delays in redesigning SSA's software system and stated:

"If they [SSA] had documentation of the current system, they would have been able to develop the proper code, the inputs and outputs—they would have been able to address such basic [system] functions much earlier in the process."

Some Software Improvement Projects Performed; However, Many Have Been Delayed

SSA's software improvement progress has been slow, but some enhancements have been achieved. For example, software improvements to the agency's enumeration system, which assigns social security numbers, has resulted in quicker issuance of social security cards. SSA has also implemented a new system to make fast payments in emergency situations. Further, according to the agency, it has increased the automation of transactions through a software system—Annual Earnings Recomputation Operations—from 57 percent for 1979 to 72 percent for 1984, through software improvements.

While these improvements have contributed to better service to the public, many software improvement projects have been delayed or cancelled. As we reported in our general management review,[12] SSA shifted 61 experienced ADP staff in April 1986 from software improvement projects to the software redesign effort. As a result of this shift of experienced staff, the agency identified about 20 systems improvement projects that either had to be reduced in scope, delayed, or cancelled. For example, SSA cancelled a project to improve the process that recalculates benefits for survivors after the death of a beneficiary. Without improvement, the system cannot effectively process certain transactions

[12]Social Security Administration, Stable Leadership and Better Management Needed to Improve Effectiveness (GAO/HRD-87-39, March 18, 1987)

of this type, causing additional manual calculations, inconsistencies, and errors in the data base and delayed payments. In chapter 4, we discuss systems limitations that remain and the adverse affects on public service.

Software Redesign Significantly Delayed

SSA has committed much time, money, and personnel resources to its shift in emphasis toward a redesign of the complete software system. Contract costs for developing functional requirements to redesign the software, since 1984, have been estimated at $11 million. SSA also expended about $15 million for software tasks under the systems engineering and integration contract. Further, over the last 4 years, SSA has shifted about 220 programmers and analysts from maintaining and improving the existing systems to redesigning new systems. Despite the increased emphasis, the project is 3 years behind schedule, and the agency will have to rely on its existing inefficient systems until the mid 1990s.

SSA's current software redesign initiatives are either in the early stage of development—developing functional requirements—or have been delayed or cancelled as shown in table 2.1.

Table 2.1: Major Software Redesign Initiatives

	Redesign Project	Status
1)	Enumeration System-issues social security numbers	Functional requirements have been completed Software design and validation have begun
2)	Claims Modernization System—calculates and issues initial claims to beneficiaries and enhances the initial claims process	This project has been delayed at least 3 years It will only affect 2 2 percent of the beneficiary-related processing transactions. However, some new software was developed to collect beneficiary claims information This has enhanced the init al claims process
3)	Program Benefits—includes claims-processing functions and makes changes to beneficiary records, such as change of address, name, and income	SSA had originally planned to complete the functional requirements for this project in 1985 It is now estimating completion in 1988 This delay will postpone improvements to a major system that SSA senior executives consider the most pressing problem area Further, a contractor's analyses indicated that this project represents about 85 percent of the processing funct ons for SSA's programs The completion date for redesigning the system is now "indeterminable "
4)	Management Information System—provides data to manage SSA workload and automate administrative tasks	The functional requirements are being developed
5)	Processing Center Control System—tracks and controls paper folders containing beneficiary information	The functional requirements and design have been performed, however, the entire project has been cancelled
6)	National Debt Management System—determines and collects overpayments	The functional requirements and design have been performed; however, implementation has been delayed and scaled down significantly The date for full implementation is "indeterminable "
7)	Annual Wage Reporting System—posts workers' earnings	The functional requirements and design have been perfo med, however, the entire project has been cancelled
8)	Quality Assurance System—provides internal controls that support software development	The functional requirements are being developed
9)	Data Exchange System— communicates data to other systems	The functional requirements are being developed
10)	Inquiry and Response System—provides beneficiary information to SSA staff	The functional requirements are being developed

These delays and cancellations have been caused by several factors. SSA officials have indicated that major software development efforts have been hindered by incomplete software standards, inadequate documentation of existing systems, and underestimation of the cost, magnitude, and complexity of the software projects. The absence of a long-range, agency-wide plan was also cited by several agency officials as a primary cause of systems problems (see chapter 3, pages 30-32).

In our general management review,[13] we reported that SSA was experiencing delays in the National Debt Management Project and the Processing Center Control System because it did not follow system-development, life-cycle standards. Specifically, the agency began designing these systems before completing the functional requirements Functional requirements are an essential step to developing new software because they specify what automated systems are to do for the users. After the requirements are established, design specifications describe how the work will be done. In one instance, SSA hired a contractor to prepare the functional requirements for the National Debt Management System. However, the agency found the requirements inadequate and requested them to be redone. To keep on schedule, SSA directed another contractor to design the system even though the functional requirements were not completed As a result, the agency found problems that were neither addressed nor considered in the functional requirements, thus necessitating modifications to the system design. This caused the system design phase to be delayed by 10 months and increased contract costs by about $1.2 million.

In another instance, SSA issued a Request for Proposals in February 1985 and awarded a contract in September 1985 to design the Processing Center Control System, before the functional requirements were completed. Because the design contractor did not have the functional requirements in SSA's standard format by September 1985, as the agency had planned, and because SSA modified the functional requirements after that date, the design completion date was delayed by about 5 months. A responsible SSA official told us that if the agency had prepared the project's functional requirements before issuing the Request for Proposals for the system design, SSA would have had a better basis for developing cost estimates and managing the project. SSA cancelled this project in December 1986 because the agency believed that it might not meet SSA's future needs.

[13]Social Security Administration Stable Leadership and Better Management Needed to Improve Effectiveness, (GAO/HRD-87-39, March 18, 1987)

Software Problems Have Delayed Implementation of an Integrated Data Base

SSA has made some progress in its data base integration program, but has not accomplished a major objective—implementing an integrated data base. This is due, in part, to the significant delays in defining new software requirements.

In 1982, SSA planned to develop an integrated data base to improve service to the public. An integrated data base would provide ready access to information, reduce data redundancies and improve the integrity and consistency of data. Further, it would use the data-processing resources more effectively and efficiently because the data base would be independent from the software applications, thus changes in the software applications would not have to affect the data base. This would save time and costs in maintaining the systems.

SSA's data base integration program is divided into two major project areas: (1) Data Base Management and (2) Data Administration. Data Base Management projects consist of activities for converting SSA's computer operations from a magnetic-tape-processing environment to a modern processing operation using available direct access storage devices (disks). Between 1983 and 1987, the number of tapes in active use has been reduced from 550,000 to 250,000 while more than 360 disk drive units have been installed. In addition, SSA developed a file-management system to provide users the ability to access individual records online. To accomplish this, the file-management system extracts the data from a variety of separate data files. This gives the appearance of being a modern data base management system because the user asks for data and gets it, without individually accessing the various separate data files.

Data Administration projects were intended to establish a logical definition of data elements—a data dictionary A data dictionary is one of the first steps in data administration; it defines the pieces of information that should go into a data base and dictates the form that they will be uniformly given. SSA has developed and is in the process of implementing a data dictionary.

In October 1986, SSA prepared a Statement of Work for a Request for Proposals to implement an integrated data base. The document described a $7.4 million project covering a 3-year period ending May 1990. By that time the contractor was to (1) perform a detailed design of an integrated data base, (2) develop detailed plans to migrate SSA's existing and future software to the data base system, and (3) assist SSA in the systems implementation. However, SSA did not complete and issue

the Request for Proposals because, as previously discussed, the functional requirements of the software redesign, scheduled for completion December 1986, were delayed until January 1988 Without the functional requirements, a contractor will not be able to identify and develop data base requirements. A key SSA agency official told us that this will delay improvements in the data base environment. Consequently, we believe that SSA's data files will continue to have duplicate data and inconsistencies well into the 1990s, further increasing the complexity and inefficiency of maintaining large individual files.

SSA Has Met Its Objective to Expand Computer Capacity; However, Its Actions Deviate From the 1982 SMP's Approach

The most unequivocal progress in implementing the SMP has been made in upgrading the capacity of computer equipment and expanding the data communications network. Since 1982, SSA has increased the capacity of its computer systems by over 800 percent. This has reduced systems operations backlogs. SSA has awarded contracts and plans to award additional contracts, all totaling $190 million, to replace and substantially expand its data communications network and its main computers at SSA's central computer facility. However, SSA has pursued its objective of expanding its computer capacity without carrying out some of the prerequisite steps called for in the 1982 SMP, such as determining software functional requirements before acquiring hardware and conducting effective pilot tests to ensure that the planned configurations of hardware and software will meet system performance expectations. By not carrying out these basic steps before acquiring its hardware, SSA has little assurance that it will fully use the hardware it is acquiring or that the system will perform as expected.

Inadequate Justification for Hardware Procurements

In August 1986, we reported[14] that SSA was procuring hardware to substantially expand its data communications network and increase its number of terminals without proper justification. At that time, we stated that it was unclear what needs these procurements would address. In addition, we noted that SSA could not determine the optimal mix of systems components because, among other things, the agency had not completed all of the related functional requirements for software development.

Under its existing system, SSA has been using 4,200 terminals to process its claims workloads. In order to implement the Claims Modernization

[14] ADP Acquisitions. SSA Should Limit ADP Procurements Until Further Testing is Performed (GAO/IMTEC-86-31, August 8, 1986).

Project, SSA estimated that it needed between 23,000 and 39,000 terminals. As we discussed in our December 1986 report,[15] the scope of the Claims Modernization Project has been significantly reduced and the remaining functional requirements, which have been delayed, are not scheduled for completion until 1988. Despite these delays, SSA did not reevaluate the number of terminals it needs. Instead, on September 24, 1986, SSA entered into a contract to procure an initial quantity of 22,892 terminals, with an option to procure 15,954 additional terminals, as well as other associated equipment. The Commissioner indicated that SSA proceeded with the contract to avoid losing time in systems modernization.[16]

While we recognize that certain benefits have been realized through ready access to terminals by SSA staff, the software that handles the large majority of the Retirement and Supplemental Security Income Programs' workload—which SSA cited in the contract as justification for procuring the 22,892 terminals—will not be completed until sometime in the 1990s. This calls into question the validity of the quantity of equipment and delivery schedules represented by the current contract—all 22,892 terminals are scheduled to be installed by September 1988. Based on past trends in technological innovations for ADP equipment, it is possible that this equipment will become obsolete before it can be fully utilized.

Ineffective Pilot Tests

Pilot testing of new systems is essential to verify that they will consistently provide correct results. A pilot test should be designed to include an evaluation of the performance for all major subsystems and functional components of the planned system as early as possible in the development cycle. As we stated in our December 1986 report on the Claims Modernization Project, SSA did not perform effective pilot tests of the project. We believed that not adequately testing new systems increases the potential for undetected errors and reduces the extent to which the software can be relied on to provide accurate information. SSA did not demonstrate, in its pilot test, the operational performance of the total configuration of the hardware it plans to procure and the software it plans to develop. Specifically, SSA had originally planned to install and test about 20 terminals at each of the 18 field offices. However, because it had difficulties in obtaining the planned number of terminals, it

[15]Software Systems SSA Encountering Significant Delays in its Claims Modernization Project (GAO/IMTEC-87-8, December 22, 1986)

[16]"Critics Don't Slow SSA's Plans GAO Advice Not Taken," Government Computer News, October 24, 1986, pp 1 and 6

installed and tested only three at each field office. At that time we stated that, with this reduced number of terminals, SSA had not obtained sufficient information to provide conclusive results on the project's impact on the operational performance of the system, field office positions, or service to the public. Despite these concerns, SSA proceeded and awarded the terminals and data communications network contract. In November 1986, the agency fully equipped the pilot offices with computer terminals. Due to the delays in software development, SSA had not been able to conduct effective tests of the software that determines eligibility and computes the benefit. We also noted that SSA's test was limited because it evaluated individual hardware and software components in a piecemeal fashion, rather than providing for an overall and thorough measure of projected performance of the components before being deployed.

Recurring Management Problems Have Impeded SMP Progress

In the 1982 SMP, SSA stated that many of its systems deficiencies were caused by recurring management problems. SSA noted that previous attempts to modernize its systems were unsuccessful primarily because of inadequate management attention, ineffective planning, and staffing deficiencies. Although SSA recognized these deficiencies and has taken some corrective actions, we found that these same managerial weaknesses have persisted over the last 5 years, impeding SSA's systems modernization effort. Specifically, SSA has not

- completed an agency-wide, long-range, operational plan to efficiently guide the systems modernization effort;
- effectively managed, controlled, and planned its systems modernization; and
- adequately staffed its computer activities.

These management problems have contributed to delays and cancellations in software improvement and redesign projects. Further, the problems have affected the overall modernization to the point that it is unclear whether the software redesign will (1) be properly integrated and implemented and (2) meet the agency's future needs efficiently. Problems in effectively managing SMP have also caused the agency difficulties in projecting the total modernization costs and providing adequate budget estimates.

Systems Modernization Proceeds Without Benefits of an Agency Operational Plan

A comprehensive, long-range, operational plan is critical to effective ADP planning because it sets forth service delivery goals and approaches. Together, these provide the framework for a long-range strategy for the development and implementation of ADP systems.

We have recommended that SSA develop a long-range plan in several of our previous reports. In September 1979, we recommended[1] that SSA assign responsibility for formulating and implementing a comprehensive, agency-wide, long-range plan to a separate organization reporting directly to the Commissioner. While acknowledging the need for such a plan, SSA said that the agency would accomplish its development through existing organizations. In May 1982 we reported[2] that SSA continued to lack an agency-wide, long-range planning process, a situation

[1]Social Security Administration Needs to Continue Comprehensive Long-Range Planning (GAO/HRD-79-118, September 20, 1979)

[2]Examination of the Social Security Administration's System Modernization Plan (GAO/HRD-82-83, May 28, 1982)

that could prevent SSA from responding adequately to future agency and program needs. At that time, the Commissioner recognized its importance and stated that SSA was working toward implementing such a process.

However, SSA proceeded to modernize its systems over the next 5 years without developing a comprehensive, long-range operational plan. We identified this and other management problems that have impeded SSA's modernization progress in our general management review.[3] We noted that SSA's long-range planning process was inhibited by several factors, including frequent changes in leadership and low priority for the central planning function. SSA senior and mid-level managers alike believe that such a plan would benefit SSA as a whole and would have a positive effect on operations. In September 1986, the current Commissioner established a central planning function to develop a long-range plan

The Commissioner's recent effort to develop a long-range agency plan is certainly a positive step. However, the lack of such a plan over the years has hindered the SMP's progress and, until a plan is completed, SMP may not be supporting SSA's mission in the most efficient and economical manner. SSA's Office of Systems had to develop SMP based on assumptions about future service delivery goals and methods of operations. Therefore, the Office of Systems assumed that there would be no major changes in operations and, according to agency officials, has been preparing functional requirements for the new system at a general level because of the lack of information on specific workloads, desired processing time, service quality or locations, and the interrelationships among the various elements of the system. This type of information directly affects the type of ADP technology needed for the new computer system, the design of the software for transaction processing, the organization of the data bases and file structure, and the type of communication system needed to transmit information.

The importance of having long-range plans when developing software systems can be illustrated by the problems SSA experienced in redesigning the Processing Center Control System. Although the agency spent about $285,000 for a contractor to develop this project, it has cancelled the project as designed. According to a cognizant official, the decision to cancel the effort was made because SSA prepared the system's requirements based on its current, not future, environment. Even

[3]Social Security Administration Stable Leadership and Better Management Needed to Improve Effectiveness (GAO/HRD-87-39, March 18, 1987)

though the redesign project was designed to control the paper folders in agency field offices, SSA did not consider the impact of a new SSA initiative—processing transactions without reliance on paper folders. SSA also did not consider the impact of the additional terminals being procured, which will provide updated beneficiary information and thus make the need for controlling paper folders less significant.

In January 1987, SSA established a new project—the Integrated Control System—to replace the Processing Center Control System. Under the new project, the agency will assess and identify tracking and control requirements for its future environment.

SSA's Problems in Effectively Planning, Managing, and Controlling Computer Operations Continue

In the past, SSA has not adequately planned and managed its modernization efforts. For example, in our 1979 report,[4] we noted that SSA did not properly plan the development of the Supplemental Security Income computerized system, which contributed to millions of dollars in erroneous benefit payments over a 2-year period. In late 1981, problems that the agency experienced in modifying the Retirement Program's automated system resulted in more than 10,000 student beneficiaries receiving late checks because their payments were erroneously suspended. These errors were due to mismanagement of extremely complex and large redesign projects.

In the 1982 SMP, SSA recognized that its past efforts to modernize the ADP system had failed due to longstanding planning and management weaknesses and stated that it

"had not undertaken the management initiatives necessary to insure adequate controls over the development, operations, and maintenance of its system."

To avoid such problems with SMP, SSA (1) obtained a systems engineering and integration contractor to assist in planning, managing, and giving continuity to implementing SMP throughout its life-cycle, (2) requested the integration contractor to develop an automated management control system to help carry out the extremely complex task of monitoring about 200 SMP projects, and (3) decided to obtain support from contractors to improve and redesign its software because of acknowledged shortages in skilled technical staff. As noted in our general management

[4]Flaws in Controls Over the Supplemental Security Income Computerized System Cause Millions in Erroneous Payments (GAO/HRD-79-104, August 9, 1979)

review,[5] however, SSA has not effectively completed these management initiatives because of staffing shortages and inadequate planning and monitoring of the contractor process. Even though SSA has recently taken actions to correct these management deficiencies, much work needs to be completed for SSA to effectively implement SMP and avoid integration and control problems.

Integration Plans Delayed

In 1982, SSA planned to develop and integrate modernized systems by March 1987; however, its integration plan was not delivered until 5 years after SMP began and does not provide sufficient, detailed technical information for SSA to effectively implement SMP. In our September 1985 report,[6] we noted that SSA diverted the integration contractor away from project management and integration support to tasks involving software development during the first 2 years of the contract, which was awarded on December 8, 1982. The agency said the change in contractor duties was necessary to compensate for internal staffing shortages. Although SSA redirected the contractor to prepare an integration plan in October 1984, the contractor did not complete the plan until December 1986—almost 5 years after SMP began. These problems contributed to the increased integration contract costs. SSA originally estimated in the 1982 SMP that by March 1985, the integration contract costs would be $6 million; however, actual expenditures by July 1985 were about $22 million. Further, when the contract expired in March 1987, the contract costs were estimated to be over $33 million.

SSA officials told us that this integration management plan was intended to be "high level," identifying and resolving only major integration problems and issues. While this plan provides a process for integration, in our opinion and in the opinion of key agency officials, it is not sufficient for effectively implementing SMP. For example, the plan does not describe how SSA should phase out its existing systems and implement the new redesigned software. SSA officials commented that SMP is at a critical point—designing and implementing new software and phasing out the existing software—and more thorough, detailed, integration plans are needed. Because the systems integration contract expired in March 1987, SSA has awarded a new contract to perform integration and

[5]Social Security Administration Stable Leadership and Better Management Needed to Improve Effectiveness (GAO/HRD-87-39, March 18, 1987)

[6]Social Security Administration's System Modernization Plan May Not Achieve Planned Objectives (GAO/IMTEC-85-16, September 30, 1985)

management tasks. SSA officials now expect this new contractor to become heavily involved in providing integration activities

Lack of proper integration plans has caused significant problems in effectively implementing SMP. For example, although SSA has designed the National Debt Management System, it has not developed plans for integrating this system with SSA's existing software system or other elements of the redesigned system. Further, because SSA does not have a clear idea on how it will phase out the existing system and implement the new system, another major redesign effort—the Program Benefits Project—may be delayed. In December 1986, an SSA Deputy Commissioner noted that

"more thorough integration is needed of all Systems Modernization activities It is not clear that all projects are working with the same assumptions or that the projects will mesh together down the road "

SMP Project Management System Not Used

As we reported in September 1985,[7] SSA directed its integration contractor to develop an automated system to provide up-to-date status on all SMP projects SSA felt an automated control system was needed to effectively monitor the interdependencies and complexity of over 200 tasks being performed. Although the contractor delivered the requested operational software, SSA did not use it because the system was too labor intensive; that is, it required too much manual data collection.

SSA has not yet developed or instituted a consolidated automated project management system, but rather depends on three separate systems: the Management Support System, the Resource Accounting System, and the Procurement Requisitions Management Information System. These systems, which have limited capabilities, result in inefficient and fragmented project control. According to systems officials, the data from these three systems must be manually aggregated to get a broad picture of SMP status. Consequently, the agency is still without a consolidated automated system to effectively monitor and control SMP tasks.

For the short-term, SSA plans to combine the activities of the Resource Accounting System and the Procurement Requisitions Management Information System into an enhanced Management Support System. This short-term solution is scheduled to be operational in 1987. For the

[7]Social Security Administration's System Modernization Plan May Not Achieve Planned Objectives (GAO/IMTEC-85-16, September 30, 1985)

long term, the agency continues to plan the development of a new, automated system that will provide integrated program management and project control for staffing, procurement, and budget activities. If SSA contracts for this system, the award date is not expected to be made until August 1987, with implementation 6 to 9 months later.

Difficulties Encountered in Software Contracts

SSA has also experienced problems in its software contracts. For example, as part of the software upgrade effort, SSA contracted with a vendor in 1983 to provide software tools and to upgrade up to 150,000 lines of SSA software code. The Office of Inspector General reviewed[8] the contract and found that the software tools installed did not fully meet the requirements defined by SSA, had not improved operational programs, and were no longer used since the software upgrade was, in many cases, not readily understandable. The Inspector General attributed these problems to SSA's desire to expedite software improvement, coupled with inadequate planning and monitoring of the contractor process.

In 1984, SSA again attempted to improve its software by awarding three contracts to improve SSA's computer programs. The Inspector General reported[9] that SSA spent about $1.1 million on these contracts and that most of the major products received were incomplete, sometimes erroneous, poorly documented, or delivered late. This was caused primarily by inadequate planning by SSA's Office of Systems, vague statements of work to be done, and inadequate systems documentation. The Inspector General noted that the effects of these contract problems were (1) wasted money, (2) delayed improvements, and/or (3) unexpected rework by SSA's employees.

In August 1985, SSA hired a contractor to develop functional requirements for a major project, Program Benefits. As late as May 1986, SSA was reporting a November 1986 completion date for this project's functional requirements. However, agency officials later determined that the effort was unsuccessful and allowed the contract to expire in December 1986 after expending $4.3 million. Both agency officials and the contractor said that the primary reason this contract was unsuccessful was underestimation of the magnitude and complexity of the system.

[8]SSA's Use of a Contractor to Improve Software, Department of Health and Human Services, Office of Inspector General, Audit Control Number 15-52649, February 6, 1985

[9]SSA Needs to Redirect its Software Improvement Efforts, Department of Health and Human Services, Office of Inspector General, Audit Control Number 15-52662, June 13, 1985

Work under the contract involved the largest part of SSA's software. According to the contractor who had performed an analysis, Program Benefits represented about 85 percent of the system's functions The contractor also explained that this project is the "heart" of the modernization program and will dictate how SSA will function over the next 20 years. Because of the system's size and significance, the contractor said that a major problem was obtaining agreement on the requirements from the system designers and users. For example, SSA developed a strategy to validate the contractor-developed requirements, which involved selecting sections of the requirements for the designers and users to review. While SSA estimated it would take approximately 30 minutes to review and validate each section, the first five sections took 9 days instead of 2 1/2 hours. On the basis of this unexpected additional time, the contractor revised its schedule to March 1987. SSA decided not to extend the contract and plans to complete the project in-house.

Problems Remain in Acquiring and Retaining Skilled Staff

A sufficient number of qualified and dedicated staff is a fundamental requirement for the maintenance and modernization of SSA's ADP systems. However, over the past decade, SSA has experienced problems in hiring and retaining qualified staff. Although SSA has performed considerable recruitment and training activities and has increased the number of computer specialists over the last 5 years, systems officials and managers told us that they still lack skilled staff for effective systems maintenance and modernization. We found that although SSA has increased the quantity of staff, many of the positions were filled at the entry level and thus did not immediately contribute to solving the skill-level problem. Further, SSA did not determine the number and skill levels of ADP personnel needed to implement SMP. Consequently, the lack of skilled staff has hindered SMP progress.

The number of computer specialist staff, such as computer systems analysts and programmers, has substantially increased. From the beginning of fiscal year 1982 to the beginning of fiscal year 1986, the number of computer specialists in the Office of Systems increased from 994 to 1,507, or by 52 percent. About half of the gain came from external sources, primarily at the entry level. Most of the external gain came from hiring efforts during fiscal years 1982 and 1985, when the Office of Systems brought in 201 and 162 people, respectively. In 1985, we reported[10] improvements in staffing resources and training, but noted

[10]Social Security Administration's Computer Systems Modernization Effort May Not Achieve Planned Objectives (GAO/IMTEC-85-26, September 30, 1985)

that SSA officials indicated that they still lacked sufficient quality of staff to implement the SMP. We noted that while the gain in entry level staff helped increase the quantity of staff, it did not immediately contribute to solving the skill-level problem. According to an SSA official, it takes about 1.5 years to train an applications programmer in basic software skills, but an additional 4 years of training and experience are needed before the programmer can contribute fully.

In May 28, 1982, we reported,[11] that SSA had not determined the number and skill levels of ADP staff needed to implement the systems modernization projects. Assessment of personnel needs is critical to determining the number of staff required to maintain the existing system as well as the expertise required to effectively design new systems. SSA was unable to determine these needs at that time because organizational realignment plans had not been completed and decisions on the number of contractor personnel to be employed had not yet been made. Five years later, in our March 1987 report,[12] we noted that SSA still does not have an assessment of its ADP staffing and skill-level needs. Although SSA officials in the Office of Systems generally believe that they need more technically qualified staff to effectively maintain and improve SSA's ADP systems, there is no long-range plan detailing what these needs are or will be, or what strategies they would use to meet these needs. These officials told us that agency-wide staff reduction goals make such planning of limited value. However, we noted in March that while SSA continues to shift staff from maintaining existing systems to redesigning software, the redesign effort has been unsuccessful, in part, because of the inadequate number of skilled staff. Consequently, we indicated that more convincing information could be used to substantiate the need for staff if there were a plan explaining what the long-range needs and alternatives are, including use of either contractor or in-house personnel or a combination of the two.

Difficulties in Projecting SMP Costs

Problems in SSA's ability to effectively manage the large, complex SMP have also surfaced in its inability to

- accurately project the total modernization costs and
- provide adequate budget estimates each year.

[11] Examination of the Social Security Administrations Systems Modernization Plan (GAO/HRD-82-83, May 28, 1982)

[12] Social Security Administration, Stable Leadership and Better Management Needed to Improve Effectiveness (GAO/HRD-87-39, March 18, 1987)

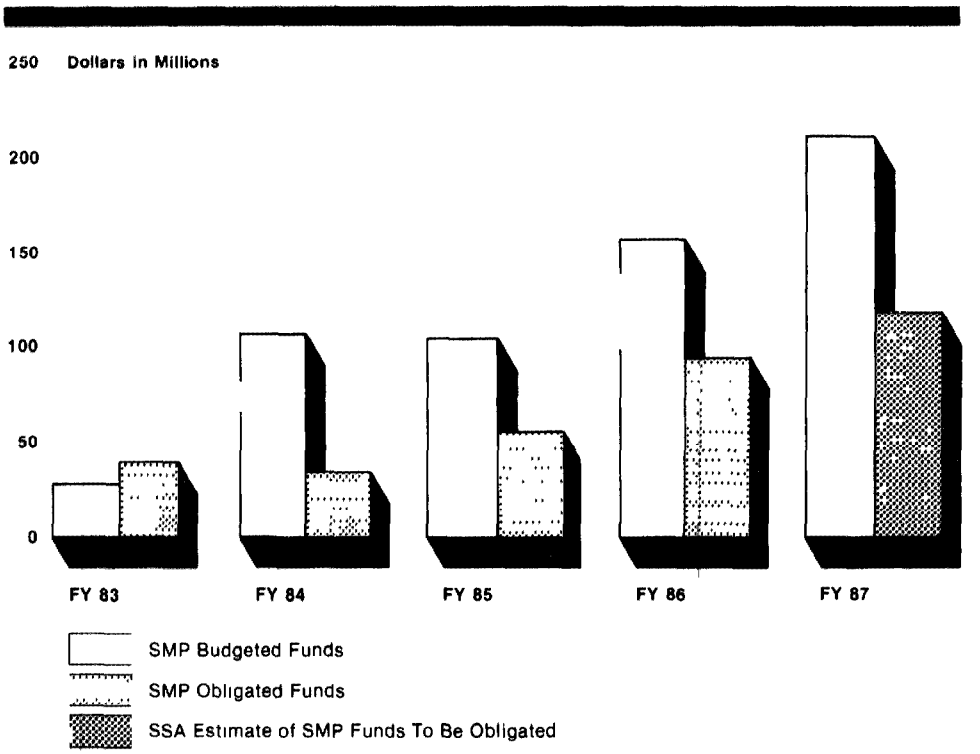
In 1982, SSA estimated that the SMP tasks outlined in its plan would be completed at a cost of $479 million. This covered the period from March 1982 through March 1987. SSA actually spent about $400 million during this time frame, including costs for the four programs in the 1982 SMP and the two programs subsequently added. However, SSA is far from completing the plan. In 1986, SSA estimated that SMP's total cost would climb to $989 million during the period from March 1982 through September 1990. However, in 1987, SSA only estimated SMP costs to be about $643 million through fiscal year 1988. Although many additional modernization activities will extend beyond 1988, the agency indicated that it could not accurately project costs for these activities because the budgetary analysis is not done beyond a 2-year period.

SSA has also experienced difficulties in carrying out its annual budget for SMP. Each year the agency submits a budget request for SMP items as part of its Information Technology Systems (ITS) budget. As we recently reported,[13] however, SSA's obligations for SMP items have been consistently below requested budget amounts for fiscal years 1984, 1985, and 1986 (as shown in figure 3.1). Consequently, SSA has accumulated a considerable amount of carryover funds.[14] Further, less than half of the SMP budgeted funds that were obligated were for projects included in its annual budget request (as shown in figure 3.2). Generally, the lower amounts of obligations appear to have resulted from (1) SMP project delays, cancellations, and scope reductions; and (2) actual project procurement costs being lower than anticipated.

[13]ADP Budget: SSA's Information Technology Systems Budget Request and Obligations (GAO/IMTEC-87-15FS, March 10, 1987).

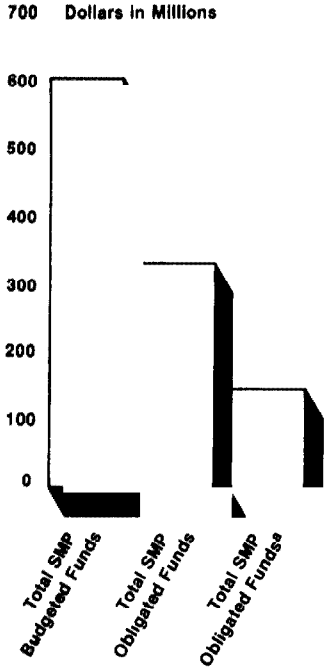
[14]SSA is authorized to carry over unobligated funds from year to year based on a no-year authorization Congress has provided since fiscal year 1983

Figure 3.1: Systems Modernization Plan—Budgeted Funds vs. Obligations for Fiscal Years 1983-87



The figure shows that SMP obligations have been consistently below expected (budgeted) amounts for fiscal years 1984, 1985, and 1986. Obligations for fiscal year 1983 exceeded budget amounts because SSA used other ITS budgeted funds for SMP projects. Estimated obligations for fiscal year 1987 that are based on SSA's Office of Systems plans as of January 7, 1987, remain well below the budgeted amounts.

Figure 3.2: Systems Modernization Plan—Total Budgeted Funds vs. Obligated From Fiscal Year 1983 Through Fiscal Year 1987



[a]Included in OMB A-11 Budget Submissions

This figure shows total funds budgeted for the SMP from fiscal year 1983 through fiscal year 1987 and the amount SSA obligated. The data shows that SSA has obligated 56 percent of its budgeted SMP funds. The data also shows that less than half of the funds that were obligated were identified in the OMB A-11 submissions as being for SMP.

SSA's 1987 SMP Is an Inadequate Guide for Future Systems Modernization

In 1982, SSA adopted the SMP as a blueprint for modernizing all aspects of its ADP operations. As a formal strategic planning document, it was to serve two major purposes: (1) to provide a status report on modernization projects and (2) to lay out the plans for future efforts. The original 1982 plan outlined the first 5 years of modernization and was to be revised each year as the agency gained experience. SSA's 1987 SMP charts the agency's modernization course for the next 5 years. However, it does not accurately reflect SSA's experience over the past 5 years, nor does it provide adequate plans to modernize SSA's systems in the future based on that experience. Specifically, the SMP does not

- adequately describe the status of software projects, over the last 5 years, specifically where SSA has fallen short of its targets for individual projects;
- adequately describe the deficiencies in the current systems, their impact on public service, and how the modernization activities will correct these deficiencies; and
- reasonably assess the risks and costs for successful completion of the SMP.

If SSA does not more accurately and completely address these critical factors, it is uncertain what progress SSA will be able to accomplish in its modernization objectives over the next 5 years and what its efforts will cost.

1987 SMP Progress Report Is Incomplete

The 1987 SMP, which was issued in October 1986, attributes many accomplishments to SSA's past 5-year effort. However, the plan does not fully recognize SSA's lack of progress in the software area—the area that the agency said was SMP's main thrust. Consequently, the 1987 SMP gives the impression that SSA has made significant progress in all modernization activities. However, in our opinion, this impression is not an accurate representation of the actual status of modernization projects. In both our opinion and agency officials' opinions, an accurate representation of the SMP's status is important because the plan is available to the public and the Congress and is used to support the budget process. Further, a complete and accurate description of the status of all modernization activities is critical to providing the foundation for effective, long-range, systems modernization planning.

In its 1987 SMP, SSA describes many modernization accomplishments, but it does not discuss the continuing problems the agency is facing in redesigning its outmoded and inefficient software systems For example, SSA

indicated that it had made significant progress in defining the functional requirements for the Claims Modernization Project. (SSA's current objectives of this project are to redesign the batch-oriented claims system to provide interactive operations and develop new software for processing a claim.) While some progress has been achieved, the effort has experienced a delay of at least 3 years. A draft document dated March 1984 indicated that the new claims software was scheduled to be redesigned by early 1985 In January 1985, SSA moved the target date for completing the new claims software to November 1986. The 1987 SMP indicated that the Claims Modernization Project would be completed in mid-1987. However, on October 6, 1986—the same month in which the 1987 SMP was issued—the project manager told us that the completion date is now unknown. Further, SSA indicated in its 1987 SMP that it had made significant progress in defining functional requirements for the Program Benefits Software redesign. Although some progress was made, a month after issuing the 1987 SMP, SSA officials told us that this project was significantly behind schedule. The Program Benefits redesign, which will have the greatest impact on SSA's ability to serve the public, will not be completed until the 1990s.

The 1987 SMP Does Not Assess Impact of Current Problems on Service Delivery

A workable computer modernization plan should demonstrate an understanding of the current ADP system—its inputs, processes, outputs, and impact on the users. Such a plan should show the critical problems in the system that have been targeted for modernization. The 1982 SMP presented a list of problems in SSA's systems, demonstrating that the agency was in a "crisis" situation. The 1982 plan stated that.

- The agency was sustaining its operations with very costly manual processes. Furthermore, calculations performed manually were error prone and caused both over and underpayments.
- Automated benefit payments were sometimes computed erroneously, duplicate payments were issued, and data items were posted incorrectly.
- The system did not efficiently and timely process beneficiary changes, such as changes in address or termination and recomputation of survivors benefits in the case of a beneficiary's death.

All of these problems lent an air of urgency to SMP's suggestion that immediate action was needed to avoid a total collapse of the system.

The 1987 SMP, however, does not thoroughly address the current deficiencies in SSA's systems. The agency decided to stress strategic planning, rather than focus on existing system problems. While strategic

planning is important, information on systems' deficiencies was to support and justify the need for systems modernization activities, such as software improvements and equipment procurements. For example, we reported in August 1986[1] that SSA proceeded to buy additional equipment without determining what ADP operations deficiencies the procurement would correct. As a result, it was not clear what needs these procurements would address or what potential mission benefit would result from the acquisitions. In our general management review,[2] we noted that SSA had not effectively assessed the critical problems in the existing system, and their impact on public service. We found that some of the systems' technical limitations and inefficiencies that existed in 1982 have not been corrected. While the agency recognizes and plans to correct these inefficiencies, which have impeded improvements in the quality of public service, it has not reflected this information in the 1987 SMP. For example:

- In 1985, about 6 million transactions were manually processed. Also, it often takes a year or more and considerable manual effort to resolve and correct inaccurate earnings records.
- Almost all of SSA's district office workload data (49 of 59 workload categories) and much other needed management information must be manually counted and tabulated by field office personnel.
- SSA is often unable to process requests for address changes in a timely manner or to improve its ability to respond to legislative changes This results in less efficient and more error-prone manual processing.
- Limitations in software applications and data systems are producing many confusing or incorrect notices to the beneficiaries. Poor quality public service results. Also, many notices still have to be generated manually by SSA's field-office staff.

We concluded in our general management review that an adequate assessment of the existing system problems was essential in order to effectively allocate staff to improve the existing system and to successfully implement the software redesign. We recommended that SSA assess these problems, including an estimate of the resources and time that would be required to correct them.

[1] ADP Acquisitions: SSA Should Limit ADP Procurements Until Further Testing is Performed (GAO/IMTEC-86-31, August 8, 1986)

[2] Social Security Administration Stable Leadership and Better Management Needed to Improve Effectiveness (GAO/HRD-87-39, March 18, 1987)

The 1987 SMP Underestimates the Risks and Costs of Completing Software Projects

A plan as large and complex as SMP must contain a reasonable assessment of the anticipated costs and risks that may be encountered during the project. Such an evaluation allows program managers to develop priorities and to target scarce resources toward achievable goals, thereby avoiding the expense of excessive time and effort on overly risky projects. In 1982, we reported that SSA was underestimating the cost, risks, and complexity of projects being undertaken by its newly developed SMP. In our opinion, the agency continues to underestimate project cost and risk, particularly in its plans for software development in the 1987 SMP.

Although the agency has gained experience during the first 5 years of SMP, it has not translated this experience into a workable assessment of software development costs and risks. For example, the 1987 SMP does not adequately discuss the Software Engineering Program—the portion of the SMP that includes all the software improvement and redesign projects—in terms of risks or costs. Instead, it focuses on accomplishments and future plans. Specifically, the plan states:

"The Software Engineering Program is a major activity of the SMP with the primary responsibility for assuring the continuous evolution toward a modern systems environment. During 1986, the software program made noteworthy progress toward meeting this responsibility. Future plans continue the evolution toward systems excellence."

The remainder of the 1987 SMP's section on software discusses the accomplishments SSA is claiming with regard to individual projects. In addition, the 1987 SMP states that SSA expects to spend over $57 million on software development projects during fiscal years 1987 and 1988. We believe that the 1987 SMP seriously underestimates the complexity and the eventual cost of the software project. As we noted previously in this report, SSA's accomplishments in software redesign have been limited to a small segment of the agency's software inventory in the Claims Modernization Project. The remainder of the project involves designing software that will handle over 80 million transactions per year, most of them through interactive processing via the agency's 22,000 terminals. Further, this software will require the transfer of an enormous number of data elements between other SSA systems and other agencies.

The extremely large scope of SSA's software development effort has been described by experts both inside and outside the agency.[3] According to a senior SSA official responsible for software development,

[3]Software News, January 1987, p 33

"It's not going to be an easy thing to do until we get all our systems rewritten, documented, and modularized and all the things we have to do to have software that's in better condition."

A consultant for the Office of Technology Assessment on SSA sees the rewriting of code as a gigantic problem, for which there is no quick fix. With millions of lines of code remaining to be written or rewritten, according to this consultant, "you're talking about a $200 million software effort—at a minimum. It could be much higher." The consultant also warns that SSA is running the risk of creating a system that is obsolete before it is finished unless the agency develops a new vision of how SSA should be doing business.

Although SSA is facing what may be the largest software development project in history, the agency has not adequately considered and addressed the above factors in SMP.

Staff Reductions Resulting From Systems Modernization Are Uncertain

SSA is proceeding toward a goal, originally developed in 1985, to reduce employment by 17,006 over a 6-year period (1985-1990). We recently reported[1] that SSA is on schedule with its staff reduction program. The agency has reduced its staff (full-time equivalents) by about 4,500 since 1985, primarily through attrition. However, future reductions—particularly those related to systems modernization—remain uncertain because SSA has not fully determined the impact of a primary software improvement program, the Claims Modernization Project (Claims Project), on staff positions in the district offices. In addition, continued delays in the design and development of beneficiary-related software improvements may hamper agency efforts to implement the single largest block of reductions—those due to automation. Because of these difficulties, management at SSA is no longer looking at the 1985 plan as a basis for reduction but instead is approaching the staff reductions 1 year at a time. As a result, while the agency will continue to reduce staff through attrition, reductions due to automation are uncertain.

Planned Staff Reductions Linked to Automation Improvements

In 1985, at the Office of Management and Budget's direction, SSA embarked on a plan to reduce its staff by 21 percent, or 17,006, beginning in fiscal year 1985 and concluding in 1990. Approximately one half of the proposed reductions are at least partially linked to automation improvements under SMP. Specifically, SSA projected the reduction of 5,325 positions, or 31 percent of the total, to the automation of SSA's claims processes through the Claims Project. In addition, the agency assumed savings of 3,279 positions as a result of other systems enhancements and procedural changes.

SSA projected that the Claims Project systems changes would reduce employee reliance on forms and manual actions to process claims. Presently, the agency relies on claims representatives to collect information from clients who are applying for SSA benefits. Another type of SSA employee, called a data review technician, extracts the necessary information from the forms, reviews it for completeness and accuracy, and keys the data into the automated system for processing.

The Claims Project will replace these manual procedures with an on-line claims entry procedure, called Direct Access Data Entry. Through this interactive procedure, claims representatives will complete applications using a terminal; data entered via the terminal will be edited on-line; at the completion of the interview, an application will be printed for the

[1] Social Security Staff Reductions and Service Quality (GAO/HRD-87-66, March 10, 1987)

claimant's signature; and the data captured during the interview will automatically establish a request for the earnings record and will create a pending claims record in the system. Thus, many functions now performed by technicians and data clerks will be eliminated.

As a result of these changes, SSA plans to phase out the following numbers of positions by 1990:

- 1,750 data review technicians,
- 1,250 claims development clerks, and
- 325 data transcribers.

Further, the agency plans to eliminate 2,000 more data review technicians by 1990 when the Supplemental Security Income program software enhancements are added to the Claims Project, bringing the total number of reductions to 5,325. This final series of reductions will occur when SSA replaces manual claims processing with software that provides interactive processing.

SSA also plans to achieve staff-year savings of 3,279 through other systems enhancements and procedural changes. The agency anticipates that various SMP systems improvement projects, such as the replacement of card readers with scanning devices,[2] would result in staff reductions. The planned savings will consist of 979 positions in fiscal year 1987; 200 in 1988; 1,100 in 1989; and 1,000 in 1990. Because SSA has not indicated the exact link between these plans and any specific project, the extent to which the agency will realize savings from future initiatives is not known

Staff Cuts Related to Claims Modernization Project Are Not Certain

SSA has made limited progress in instituting reductions related to automation improvements. For fiscal years 1985 and 1986, the agency claims approximately 760 work-year savings through other systems enhancements. However, it is uncertain whether the agency will be able to reduce 5,325 staff through Claims Project improvements by 1990

When SSA established its staff reduction goal, it assumed that: (1) planned claims systems improvements would reduce and eventually replace manual work and (2) Claims Project improvements would be implemented on schedule. However, we found that

[2]Equipment that uses light sensors to read code or numbers from a document for computer processing

- the effect of Claims Project on staffing levels and workloads at district offices has not been sufficiently established; and
- the completion dates for implementing the Claims Project have been delayed, thus preventing the agency from developing a detailed study of the new software's impact on positions.

SSA has assessed the impact of automation on field office positions, but the results are inconclusive. The initial studies showed that the Claims Project will significantly reduce the workloads for data review technicians and teletypists, but the agency is conducting further tests to obtain more conclusive results. In addition, the studies raised questions on whether the Claims Project will cause an increased workload on claims representatives who process retirement claims.

The agency used a two-phased pilot test for the Claims Project to evaluate both its effectiveness and the human factors of office automation. The first phase of the pilot test began in early 1985 at the York, Pennsylvania, and Baltimore, Maryland, field offices after the installation of about 40 computer terminals in each office. The second phase began in early 1986 at 18 additional field offices; however, SSA installed only three terminals at each site, substantially reducing the scope of the study. By testing a reduced number of terminals in 18 of 20 offices, SSA has not obtained sufficient information to provide conclusive results on the Claims Project's impact on field office positions.

SSA conducted "before and after" tests of field office positions at the York and Baltimore pilot offices, and the results indicated a substantial reduction in workload for data review technicians and teletypists, around 40 percent and 25 percent, respectively. SSA also conducted a "before" test at the 18 other pilot offices and achieved similar results. The test report noted that, on the basis of the findings, the agency must ensure that plans are underway for the eventual reassignment of these employees. However, the report also stated that more information was needed because of the limited sample size in the York and Baltimore pilot offices. Because SSA has only performed "after" studies at 2 of the 20 pilot offices, the agency plans to broaden the sample upon which to base conclusions about the Claims Project's impact on field office positions. SSA plans to conduct "after" studies in 1987 in the 18 field offices that are now fully equipped with new computer terminals.

The results of the pilot tests in Baltimore and York also raised questions concerning the impact of the Claims Project on the workload handled by claims representatives. The "after" studies in Baltimore and York

showed a discrepancy in the average time a claims representative needed to process a claim. In York, the average time per claim rose 18 percent from the time required under the "before" study, while in Baltimore, the amount of time fell 24 percent.

The reasons for this discrepancy have not been clarified because insufficient information was obtained from the two offices. The test report attributed the difference, in part, to the apparent disruption of the York office's highly structured workflow by the implementation of the new system. Further, the report states that additional data on claims representatives would help clarify the situation if the differences continue. However, an agency official stated that the whole claims process under the Claims Project may actually take longer than before because of the additional time needed to both interview clients and enter data. SSA plans to conduct further studies at the 18 pilot offices to clarify this issue.

Further uncertainty over staff reductions is linked to SSA's persistent difficulties in redesigning major programmatic software under the Claims Project. Originally scheduled for completion in 1985, this project has been delayed, thus hindering the agency's ability to assess the impact of the Claims Project on staff positions. According to a senior SSA official, further delays in the agency's software redesign projects will cause the staff reduction plan to be "stretched out" beyond the 1990 time frame. In addition, field operations personnel believe that while implementation of the Claims Project could save some positions, current reduction estimates are high.

Conclusions and Recommendations

Conclusions

Although SSA initiated SMP in 1982 to solve what it reported as a "system crisis," after 5 years and expenditures of over $400 million, SSA has not accomplished the most critical objective of the 1982 plan—improving and redesigning its software. Without the planned progress in developing new software, SSA will have to (1) rely on its existing inefficient software systems until the 1990s, (2) expend over $190 million for equipment that may be obsolete before it is fully used, and (3) delay the development of an integrated data base, which was needed to improve processing efficiency.

Multiple software improvement and redesign projects have been delayed and cancelled, wasting time and money. The largest part of SSA's software, representing the majority of system functions, is 3 years behind schedule, and its completion date is now indeterminable. The agency has not achieved its software development objectives, in part, because it did not follow the technical strategies of SMP. While the plan stated that SSA would first develop proper software standards and improve existing software before proceeding to redesigning systems, the agency deviated from this approach by attempting to perform a complete software redesign before completing the first two tasks.

Since SMP called for a logical, sequenced approach to improving software, data base integration, equipment, and data communications, the lack of progress in redesigning new software has delayed SSA's implementation of an integrated data base. Consequently, the agency will have to continue processing transactions with files that contain duplicate and inconsistent data, thus continuing ineffective, inefficient processing

In addition, SSA has procured equipment to expand ts data communications network without carrying out some of SMP's prerequisite steps, such as determining software functional requirements and conducting effective pilot tests of the planned hardware and software configurations. Consequently, SSA is acquiring hardware with little assurance that it will fully use the hardware or that the system will perform as expected.

Although several improvements have been made, the limited progress in the software program has impeded improvements in the quality of public service. SSA's existing systems environment still has many technical limitations, inefficiencies, and error-prone manual processes. Moreover, SSA has continued to modernize its systems without adequately analyzing its current system deficiencies and the corresponding impact

on the public service. Further, SSA's 1987 SMP does not accurately describe the system's modernization status, nor does it provide adequate plans for future systems modernization efforts based on SSA's past experience. We believe this could not only affect the agency's ability to successfully and economically complete SMP, but also u timately may reduce the effectiveness with which SSA performs its mission. Finally, although SSA should be able to achieve staff reductions, the extent of such reductions is uncertain.

The overall modernization effort was an extremely complex undertaking. We believe that SSA underestimated the magnitude of corrective actions needed and the time frames and resources required to ensure successful implementation. Further, the agency has attempted the complex modernization task (1) without adequately controlling, managing, or planning critical projects, (2) without a long-range operational plan, and (3) without a clear perspective on modernization costs. This raises serious concerns about whether SSA has an accurate picture of how the new system will be implemented and whether the modernization effort will result in systems which efficiently support the agency's mission in the future.

In light of SSA's continuing difficulties in managing the large, complex SMP, we recommended in our general management review that SSA develop an operational long-range plan that provides sufficient goals and direction to guide systems modernization efforts. In addition, to provide adequate control over software development, we also recommended that the agency complete and enforce software standards.

Recommendations

We recommend that the Secretary of Health and Human Services require the Commissioner of the Social Security Administration to redirect its systems modernization activities, while completing its long-range operational plan.

In redirecting its modernization effort, SSA should do the following:

- Revise its systems modernization plan to (1) define and prioritize system deficiencies and (2) identify methods for correcting these deficiencies.
- On the basis of this revised plan, reduce the scope of the modernization effort to address the most critical system deficiencies, emphasizing software redesign. SSA should use this focused effort to demonstrate its ability to complete software redesign and to determine requirements for the total hardware and software configuration.

- Complete sufficient detailed documentation of the existing systems to support software redesign.
- Adjust hardware procurement plans to reflect the actual needs of the agency based on the modernization effort's reduced scope.

Matters for Consideration by the Congress

The Congress should consider limiting SSA's future ADP appropriations to the maintenance and operation of its current systems and only those critical modernization and improvement initiatives identified in its revised systems modernization plan. These limitations should remain in effect until SSA has demonstrated its ability to complete software redesign, has determined its system configuration requirements, and has had its revised plan reviewed by appropriate committees of the Congress.

Request Letter

February 18, 1986

The Honorable Charles A. Bowsher
Comptroller General
General Accounting Office
Washington, D.C. 20548

Dear General:

During the Subcommittee's hearings last fall on the contract irregularities involving Deloitte Haskins & Sells, you testified that the Social Security Administration's (SSA) $479 million systems modernization project was two years behind schedule and substantially over budget ($300 million). As you know, in its 1982 report on SSA's computer operations, the Committee found, among other things, that SSA had long avoided the decision to redesign its computer software systems, preferring instead to procure sole-source additional hardware capacity. Further, the Committee found that SSA's modernization plan was inadequate and would not meet the future requirements of the agency. Given your testimony on the current status of the modernization plan, it appears that SSA is once again on the verge of failing to ensure that it has a viable computer system capable of servicing the needs of our nation's elderly.

Consequently, I believe that it is essential that GAO initiate another review to determine (1) if SSA's on-going and planned computer procurements are fully justified and will meet the requirements of the agency, (2) whether the modernization plan should be cancelled or redirected and, if so, what are the most viable alternatives that SSA should be considering, and (3) if there is any validity to SSA's assertion it can get rid of 17,000 workers as a result of the agency's current automation efforts.

I would appreciate it if your findings, conclusions and recommendations regarding on-going procurements be available by May 1, 1986, and a final report on the entire review be done by February 1, 1987.

Sincerely,

JACK BROOKS
Chairman

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