United States General Accounting Office

GAO

Report to the Chairman, Government Information, Justice, and Agriculture Subcommittee, Committee on Government Operations, House of Representatives

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FEDERAL REGISTER

Better Electronic Technology Planning Could Improve Production and Dissemination

GAO/GGD-93-5

GAO

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General Accounting Office
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General Government Division

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November 10, 1992

The Honorable Robert Wise
Chairman, Government Information,
Justice, and Agriculture
Subcommittee
Committee on Government Operations
House of Representatives

Dear Mr. Chairman:

This report responds to your request that we review the use of information technology in publishing the Federal Register. The report discusses the planning for and application of electronic technologies in the production and dissemination of the Federal Register.

As arranged with the Subcommittee, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the date of the report. At that time, we will send copies to the Director of the Office of Management and Budget, the Archivist of the United States, the Public Printer, the Director of the Office of the Federal Register, interested congressional committees and subcommittees, and other interested parties.

The major contributors to this report are listed in appendix II. If you have any questions, please call me at (202) 275-8676.

Sincerely yours,

L. Nye Stevens
Director, Government Business
Operations and Information Issues

Executive Summary

Purpose

The Federal Register is a key source of information about governmental processes. Thirty-three thousand copies of the Federal Register are published daily, and thousands of individuals and organizations that transact business with the federal government, are subject to government regulation, or are interested in the operations or activities of the federal government regularly read it. Although publication of the Federal Register has been primarily paper based since it was first issued in 1936, future publication will increasingly rely on the use of electronic information technologies.

At the request of the Chairman, Government Information, Justice, and Agriculture Subcommittee, House Government Operations Committee, GAO reviewed the use of information technologies in producing and disseminating the Federal Register to assess if the publishing process could be more effective and efficient.

Background

The Federal Register Act, which became law in 1935, established a uniform system for publishing and disseminating to the public the increased number and expanded scope of federal regulations. The Federal Register system consists primarily of two major publications, the Federal Register and the Code of Federal Regulations (CFR). The daily Federal Register provides official notice of new, revised, or proposed regulations, agency notices, and presidential documents. The Federal Register also updates the annually revised and issued CFR, a codification of all federal agency regulations. Publishing the Federal Register and CFR requires coordination between federal agencies, the Office of the Federal Register—a unit within the National Archives and Records Administration—and the Government Printing Office (GPO). Individual agencies draft and submit regulations and notices to the Office of the Federal Register after review and approval by the Office of Management and Budget. The Office of the Federal Register reviews and edits the documents for style and format and schedules the documents for publication. GPO then typesets, prints, and distributes the documents. (See pp. 11-13.)

The Administrative Committee of the Federal Register prescribes regulations governing Federal Register publications including the manner and form in which the Federal Register is printed and distributed. The Administrative Committee of the Federal Register consists of the Archivist of the United States, who heads the National Archives and Records

Administration and serves as committee chairman, an officer of the Department of Justice, and the Public Printer, who heads GPO.

Results in Brief

The CFR has been maintained in electronic format for over a decade, but most documents submitted for inclusion in the daily Federal Register continue to be processed solely on paper until final composition at GPO. Agency submission of Federal Register documents in electronic format could reduce GPO composition costs and improve operations, but an automation initiative designed to do this has not been widely adopted by agencies because they believe it is not cost-effective. Little progress has been made in implementing plans to allow agencies to submit documents to the Office of the Federal Register for publishing using telecommunications. Government dissemination of the Federal Register in electronic formats has also been limited. The only electronic version of the daily Federal Register available from the government is a magnetic tape that does not include all the material that appears in the printed version. Little is known about user interest in various electronic publication formats.

The Administrative Committee of the Federal Register has tried to increase the use of information technologies, and it directed the Office of the Federal Register and GPO to plan and develop several automation pilot projects and initiatives in 1985. But because the Administrative Committee did not provide continuing guidance and support or develop other plans, there was limited progress overall. At its last meeting in June 1992, the Administrative Committee of the Federal Register directed new initiatives be developed. However, there is no clearly articulated strategic plan describing how Federal Register publications will be produced and distributed in the future and the systems and technologies needed to support those operations.

GAO's Analysis

Composition Costs Could Be Reduced

Agencies spent roughly $21.5 million publishing in the Federal Register in 1991 based on GPO charges of $375 per page. About 85 percent of the pages published were processed solely on paper until they were keyed or optically scanned by GPO during the composition process. The other 15

percent were submitted in electronic format or were photographed directly by GPO. (See pp. 20-22.)

GPO offers agencies a 30-percent discount for documents submitted in electronic format but only if GPO typesetting codes are correctly inserted. Such electronically prepared documents require minimal processing by GPO and avoid many processing costs such as rekeying or scanning, mark up, and proofreading. If a third of the 1991 Federal Register pages published had been submitted in electronic format with the typesetting codes, agencies could have realized discounts of approximately $2 million. However, only 8 percent of the pages published in 1991 were provided in this coded electronic format despite the available discounts. Agencies make little use of the discount because they believe the costs to develop and maintain the coding capability exceed the discounts offered. Further, GPO has done little to promote this program. (See pp. 20-24.)

Agencies are interested in submitting Federal Register documents in electronic format but not necessarily in inserting GPO's typesetting codes. GPO has accepted and processed electronic documents prepared with a widely used word processing program or as a generic text file without the formatting and printing codes that word processor programs embed in the text. Because documents prepared using these methods do not contain the typesetting codes, GPO has to add typesetting codes and proofread the documents.

However, by accepting such documents, GPO can avoid having to rekey or optically scan manuscripts that agencies have already put into electronic format. In 1991, GPO's $9.3 million composition costs included about $4.3 million in keyboarding charges. GPO said it was desirable to have a document in electronic format but cited technical difficulties and inefficiencies associated with converting some word processed documents to typeset coded documents as reasons why they might not generally use these files or offer a discount for them. (See pp. 22 and 26.)

If standards and procedures were established that assure efficient and reliable processing of electronic documents in different formats, GAO believes cost savings and improved accuracy could be attained. (See pp. 29-30.)

Limited Electronic Dissemination

Use of GPO's daily magnetic tape version of the Federal Register is limited to private sector organizations that resell this information in other

electronic formats to end users. Other methods for disseminating Federal Register publications in electronic format are being considered by GPO and the Office of the Federal Register. Past dissemination pilot projects have explored the use of FM radio broadcast stations for transmitting the Federal Register to remote receivers and providing selected Federal Register documents on disk. GPO recently initiated an electronic bulletin board that will include portions of the Federal Register and CFR. GPO has also proposed developing satellite broadcast and on-line electronic dissemination of government publications in general. (See pp. 32-34.)

In order to develop cost effective electronic publications, better information is needed on what electronic products Federal Register users are interested in. Market assessments for the Federal Register in electronic formats have been limited to small-scale, informal studies. (See pp. 35.)

Strategic Plan to Guide Long-Term Use of Technology Is Lacking

Past efforts to use electronic technologies to produce and disseminate the Federal Register have been limited partly due to inadequate planning. The Administrative Committee of the Federal Register has no current, formally articulated plan describing the production and dissemination processes expected to be used in the next 5 years. Inadequate planning in the past has resulted in additional costs, delays, and suspension of some projects. (See pp. 38-41.)

Because the Administrative Committee of the Federal Register includes top management officials who can provide the management direction and commitment needed to guide and support strategic planning, the Committee is the appropriate entity to direct electronic initiatives and guide the strategic planning process that will shape the future of the Federal Register. (See pp. 42-43.)

Recommendations

GAO recommends that the Chairman and members of the Administrative Committee of the Federal Register increase the use of electronic technology to produce and disseminate the Federal Register by

- providing more format options and establishing telecommunications as a method for transmission of agency documents (see p. 30),
- obtaining better information about customer markets for electronic products (see p. 37), and

- developing a strategic plan that defines future publication processes and the information technologies needed to support them (see p. 43).

Agency Comments

GAO discussed a draft of this report with GPO and National Archives and Records Administration and Office of the Federal Register officials, who generally concurred with the report's findings and recommendations. However, in so doing, National Archives and Records Administration and Office of the Federal Register officials questioned whether the Administrative Committee of the Federal Register could institute changes in publishing the Federal Register. They noted that most changes would have to be made by GPO and it was not clear that the role of the Administrative Committee of the Federal Register was to interfere with GPO printing methods. (See pps. 30-31, 37, and 43.)

GAO believes that because publishing the Federal Register and CFR is a shared responsibility of GPO, the National Archives and Records Administration, and the agencies, automation planning should reflect the perspectives of the various organizations involved. The Administrative Committee of the Federal Register is in a unique position to integrate the use of automation across all facets of production and dissemination; however, GAO acknowledges that to take advantage of this position the Administrative Committee of the Federal Register will have to assume a more active role than it has in the past. (See p. 43.)

Matter for Congressional Consideration

Given the relative lack of action to date, Congress should consider holding oversight hearings to assess progress made by the Administrative Committee of the Federal Register. (See p. 43).

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Abbreviations

ACFR	Administrative Committee of the Federal Register
ADP	automated data processing
CD-ROM	compact disc-read only memory
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FR	Federal Register
GPO	Government Printing Office
HCFA	Health Care Financing Administration
LAN	local area network
NARA	National Archives and Records Administration
NARDAC	Navy Regional Data Automation Center
OFR	Office of the Federal Register
OPTS	Office of Pesticides and Toxic Substances
PC	personal computer

Introduction

The Federal Register (FR) is a daily publication of the Office of the Federal Register (OFR), a unit within the National Archives and Records Administration (NARA). The FR was established by the Federal Register Act of 1935 (44 U.S.C. chapter 15) as a centralized method to inform the public of regulations and legal notices issued by federal agencies and the president. Documents are arranged in the FR under the following headings: Presidential Documents, Rules and Regulations, Proposed Rules, Notices, Sunshine Act Meetings, and Corrections. The FR and the annually revised Code of Federal Regulations (CFR) are the two major publications that promulgate government regulations and provide a current version of each agency's regulations.

A 1937 amendment to the Federal Register Act provided for a permanent codification (numerical arrangement) of agency rules and regulations. The CFR now contains 50 titles covering topics that are subject to federal regulation. OFR assigns each agency the title, subordinate chapter, and parts in which to publish its regulations. Documents published in the daily FR as codified regulations change the appropriate CFR volume and keep it current. The CFR is published annually, with about one fourth of the volumes being issued each quarter. The 1991 edition of the CFR contained 196 volumes and 125,331 pages.

The Federal Register Act also established the Administrative Committee of the Federal Register (ACFR) to prescribe regulations and establish policy. The ACFR has three voting members. The archivist of the United States, who is the top official at NARA, is the chairman. The public printer, who heads the Government Printing Office (GPO), and a representative of the attorney general are members. The director of OFR serves as the secretary to the ACFR.

ACFR responsibilities include setting FR subscription and single issue prices, establishing the number of copies to be printed, and prescribing the manner and form to print and distribute the FR. ACFR is served by a standing subcommittee made up of OFR and GPO staff. The subcommittee carries out various tasks such as developing agendas for ACFR meetings and developing subscription and page-rate price proposals.

The FR is a large publication. During calendar year 1991, 252 daily editions were published with a total of 57,975 pages, or an average of 230 pages per issue. As shown in figure 1.1, the number of FR pages published grew dramatically after 1970 and peaked in 1980. From 1982 to 1990, the number

of pages published stayed around or below 50,000. The 1991 increase in the number of pages published was the largest yearly increase since 1979.

Figure 1.1: Total Pages Published in the Federal Register 1970 - 1991

Overview of Federal Register Publishing

Responsibility for producing the FR is shared by federal agencies, OFR, and GPO. In preparing their FR documents, agencies have to meet format and content requirements and follow GPO Style Manual conventions. Regulations require each agency to have an FR liaison officer and a certifying officer. The liaison officer represents the agency in the publication process. For example, when OFR editors have a question or need to change an agency document submitted for publication, they contact the liaison officer. The certifying officer ensures that the agency submits to OFR an original and two duplicate originals or certified copies of the original.

After Office of Management and Budget review and approval, agency submissions are processed at OFR through three units that log in, review,

and edit the documents for style and format; schedule the documents for publication; and prepare supporting material such as the FR table of contents. If OFR has a problem with a document, OFR calls the agency FR liaison officer or the agency contact person identified in the document to resolve the matter. OFR makes no substantive changes without permission from an agency's FR liaison officer or other contact person identified in the document. OFR also makes the documents available for public inspection the day before they are published.

The FR routinely operates on a 4-day publication schedule. GPO messengers come to OFR several times a day to pick up agency documents that OFR has processed. GPO typically gets the document from OFR during the second day of the 4-day publishing schedule. At GPO, agency FR documents that are in manuscript form are either typed or processed through an optical scanner to put the text in an electronic format. GPO typesetting codes are marked on the manuscript copy and added to the electronic file as it is typed or after it is scanned. GPO staff use computer programs to help insert codes and detect coding errors.

Pages of the coded electronic document called "galley proofs" are then printed out, proofread, and corrected by GPO staff. Proof pages in camera-ready final format are then produced and reviewed by both GPO and OFR staff before being sent to GPO's printing section. Graphic contents such as illustrations and maps are normally prepared from agency camera-ready copy and are not part of the electronic file. If requested by agencies, some FR documents, for purposes of accuracy or legibility, are photocomposed directly from camera-ready copy rather than composed from the electronic file.

GPO distributes the FR and the CFR in paper, microfiche, and on magnetic tape. As of December 1991, there were about 32,600 paper and 2,000 microfiche subscriptions to the FR. Almost two-thirds of the paper (64 percent) and microfiche (62 percent) copies are distributed to the public through the mail. Effective October 1, 1992, the prices of annual paper and microfiche subscriptions were increased to $415 and $353, respectively. The remaining subscriptions are provided without charge to federal depository libraries, federal agencies, Congressional members, and the courts, upon request. Executive, judicial, and legislative branch agencies may request as many FR copies as needed for official purposes. GPO has seven subscribers for the daily FR magnetic tape at $37,500 each per year. Various private sector organizations purchase these tapes and then resell

the FR information in other electronic formats such as an on-line data base or CD-ROM (compact disc-read only memory).

According to GPO, fiscal year 1991 sales of the FR and CFR totaled about $22.1 million, or 27 percent of GPO's $81.5 million total sales revenue. Sales of CFR sets and individual volumes represented $14.6 of the $22.1 million. Subscriptions to the daily paper FR accounted for another $6.9 million. FR microfiche subscriptions, single issues, and magnetic tape sales accounted for the remaining amount. These figures do not include $21.5 million agencies paid to publish in the FR.

Office of Federal Register

OFR is the central publication point for a variety of government documents. Besides the FR and CFR, OFR publishes the Weekly Compilation of Presidential Documents, Public Papers of the Presidents, The United States Government Manual, United States Statutes at Large, Privacy Act Compilation, Guide to Record Retention Requirements in the CFR, and "slip laws," which are the first official publication of a law. OFR also prepares and publishes various supplementary material related to these publications. For example, OFR publishes several finding aids such as monthly and annual indexes to assist FR and CFR users. Additionally, OFR provides agencies training and technical assistance in document drafting and publication procedures and responds to agency and public inquiries concerning agency documents and publications.

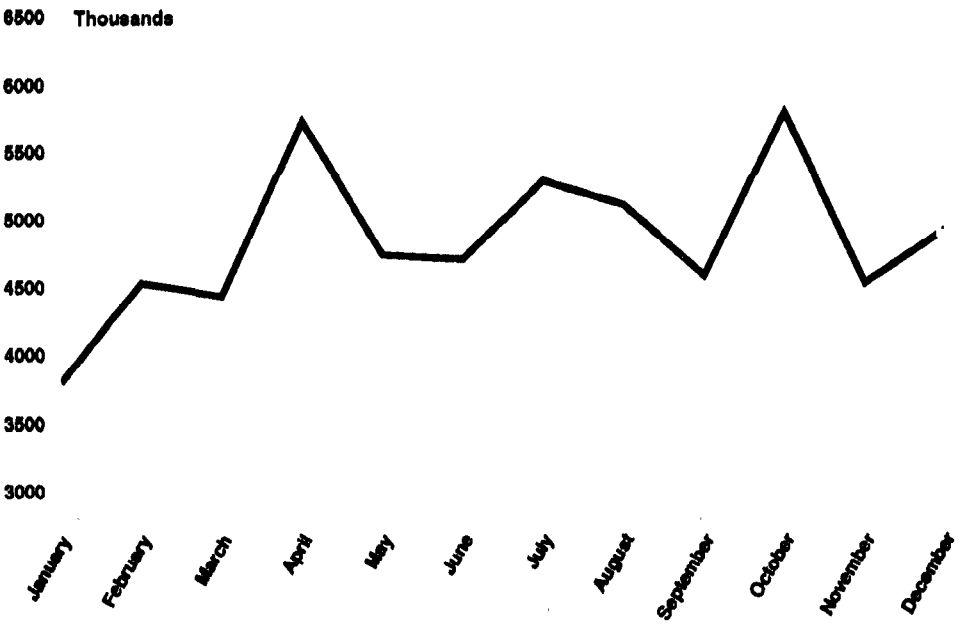
OFR's fiscal year 1991 budget was $3.8 million. OFR's Director said that about half of OFR's staff of 66 is assigned to producing the FR and CFR. OFR has an authorized staffing level of 77. OFR's Director cited difficulty in recruiting and retaining staff as a major problem facing the office.

OFR is organized into two primary divisions: one for executive agency documents and one for presidential and legislative documents. OFR also has a legal services support unit and an automation services and development unit. The Executive Agencies Division produces the FR and CFR and consists of four units. Three of these units, staffed primarily with writer-editors, produce the FR and FR indexes. The fourth unit produces the CFR.

OFR's operations are primarily production oriented. According to OFR's Director, because of the legal implications of FR documents, getting the FR out every day is the highest priority. In meeting this priority, OFR has to meet publication deadlines but is unable to control the workload since

agencies determine when to submit their FR documents to OFR. OFR's workload—the number and length of FR documents that must be processed at any given time—is unpredictable. Figure 1.2 shows the variation in the monthly number of FR pages published in 1991. The Director characterized OFR's current staff and budget resources as fully committed to production with little or no staff time or funds available for other activities.

Figure 1.2: Total Pages Published Per Month in the Federal Register, Calendar Year 1991



Overview of FR/CFR Automation at OFR

The OFR automation equipment used to produce publications includes personal computers (PC) and minicomputers, many of which are connected on a local area network (LAN). Much of this equipment and support software is loaned to OFR by GPO. The equipment owned by OFR, primarily the PCs, was acquired in the last 5 years. GPO minicomputers support the LAN operation or are part of the text-editing systems GPO has at OFR.

OFR's FR operation is less automated than its CFR operation. Most FR document processing is done on manuscript with only a small percentage of FR documents submitted on computer disks. OFR staff use PCs to review those disks and, if necessary, make minimal changes. Until recently, FR

automation centered on using GPO's ATEX computer system[1] to produce the table of contents, various cumulative FR indexes, and other FR finding aids. To produce these aids, OFR staff keyed the relevant information along with GPO typesetting codes into electronic files that were sent to GPO on tape for printing. Some small files would be telecommunicated to GPO.

OFR's CFR operation uses electronic files that have already been keyed and coded. The CFR unit updates its electronic CFR database using a daily FR magnetic tape provided by GPO and, in turn, provides GPO with updated tapes of CFR volumes. Each quarter about 80 tapes are sent back and forth between OFR and GPO to print the updated CFR volumes. OFR staff electronically transfer new material from FR final rule documents published during the previous year into the last annually updated CFR database.

OFR is shifting its automated FR/CFR production functions from GPO's aging ATEX systems to the PC-LAN. The FR table of contents, monthly index, and other finding aids are now produced on PCs using customized commercial indexing and document tracking software that OFR purchased. The CFR database will also be converted to the PC-LAN system. OFR and GPO officials said that they expect to transfer all document processing from the ATEX systems to the PC-LAN system in 1993. GPO also expects to install a high speed communications link that will connect OFR's LAN to GPO. The link will allow OFR and GPO to electronically transfer FR and CFR files and reduce the volume of tape processing.

In addition to working directly with FR/CFR text, OFR also maintains a variety of control forms and logs to monitor the production process. A 1990 NARA management study of OFR noted that many of the production controls were done manually and should be automated to be more efficient. At the time of our review, some of these manual operations had been automated by the indexing and document tracking software, but not all. OFR's routine collection of production statistics from the FR/CFR units is also done manually.

OFR also maintains and updates all distribution lists for FR and CFR publications that are provided without charge for official purposes. OFR converted the official distribution mailing files from GPO's mainframe computer to a PC and took over responsibility for maintaining these lists in 1990. OFR handles all requests for changes to the list and telecommunicates

[1]ATEX is a computer system designed for text editing consisting of a minicomputer, terminals, disc drives, other peripherals, and software used for composing publications.

the updated lists to GPO, which prints the labels and mails the copies. Ongoing OFR automation projects include creating a PC database to track FR corrections, update the CFR mailing list, and automate a correspondence log.

To support the office's technical needs, OFR created an Automation Services and Development Unit in 1987. According to the unit's director, the unit evolved out of OFR's CFR operation. The unit's staff of four consists of OFR writer-editors and information specialists who developed their technical expertise as OFR became more electronically automated. The unit provides support for all aspects of OFR's automated systems including staff training on automated systems.

GPO Shapes OFR's Automation

OFR's automation efforts, until recently, have been an offspring of the automation capabilities GPO developed to support printing production. GPO has been supplying OFR with automated systems equipment, software, and technical support that has enabled OFR to automate various FR/CFR production functions. This relationship has provided OFR with valuable automation resources that it would not otherwise have.

In 1977, GPO first installed two ATEX-text editing systems at OFR to produce the FR index and CFR updates. OFR began using these systems for other publications. By 1983, OFR and GPO were concerned that more terminals were needed and that the systems did not provide adequate storage or backup capabilities. In 1986, a joint OFR/GPO task group studied OFR's existing capabilities and future needs and proposed enhancing OFR's computer systems. The ACFR concurred with the task group's proposed plan. GPO then added more terminals, storage capacity, and two additional minicomputers to OFR's existing system.

When GPO indicated it would replace its ATEX systems with PCs for production and text editing in 1988, OFR did not know if GPO would provide the necessary PCs. Consequently, OFR sought and received NARA budget approval to purchase them. Since 1988, OFR has acquired 39 PCs through several purchases, using year-end funds or reprogramming other budget categories. OFR chose PCs that would work with composition software written by GPO and that GPO would be able to support.

When OFR sought NARA's guidance and assistance concerning a document tracking system, the need for it to be compatible with GPO systems shaped the development process. The system was to operate on a PC-LAN and

enable OFR staff to respond more efficiently to status requests about FR documents and to help create the FR table of contents. NARA worked with OFR to obtain a feasibility study and requirements analysis. The LAN that the study proposed installing raised GPO concerns about incompatibility with its systems. GPO ultimately provided a LAN to OFR.

After OFR's efforts to develop a tracking system in house did not progress as expected, NARA helped OFR obtain commercially available software for preparing indexes that was supplemented with a customized document tracking component. Capability to insert GPO typesetting codes into the files was a significant software requirement for these procurements.

Although NARA's role in OFR's automation efforts is increasing, GPO continues to be OFR's primary supplier of needed equipment and software for production. OFR has requested specific budget increases for automation in recent years, but NARA did not approve them. When problems arise with OFR's systems, GPO sends its technicians to provide assistance. NARA automation officials said their involvement with OFR includes review of OFR automation requisitions to ensure compatibility with GPO guidance and NARA plans for its administrative support systems.

Objective, Scope, and Methodology

The Chairman of the Government Information, Justice, and Agriculture Subcommittee of the House Committee on Government Operations requested that we review the production and dissemination of the FR, focusing on the use of technology to make these operations more effective and efficient. We focused our review on whether improvements could be made in (1) the production and transmission of agency FR documents in electronic format, (2) electronic dissemination efforts, and (3) long-range planning for using electronic technologies to publish the FR.

While the focus of our work was on OFR operations, we also reviewed FR publication practices at selected agencies and GPO's production and dissemination practices. In general, GPO systemwide efforts to automate its composition and printing functions were beyond our scope except when they involved FR operations at OFR and the agencies. We also centered our review of CFR publication operations on OFR. CFR operations at agencies or GPO were assessed as necessary to our review of OFR's CFR operations. Our review was not intended to be a technical examination of the automation systems used but rather a broad assessment of automation used to publish the FR and CFR.

We interviewed officials at OFR, NARA, GPO, and selected agencies about planning and using automation to publish the FR. Additionally, we interviewed the automation unit staff and supervisors of OFR units that review and edit the FR and CFR to obtain further perspective on automation efforts. We reviewed OFR and NARA records concerning OFR automation procurement. We also observed the GPO units responsible for composing and keying FR documents.

To assess agency FR publishing experiences, relationships with OFR and GPO, and perspectives on automating FR publications, we did a telephone survey of 18 FR liaison officers at 17 selected departments and agencies. These departments and agencies, which are listed in appendix I, were selected because they publish the most pages in the FR and collectively account for over half of the pages printed in fiscal year 1990 or because they had experience submitting FR documents in electronic formats. To obtain information on users' views concerning FR dissemination, we (1) held a focus group with selected librarians at the 1991 annual convention of the American Library Association, (2) contacted representatives of six major private sector organizations that provide electronic versions of the FR to the public, and (3) reviewed available OFR and GPO data concerning FR electronic dissemination.

We also obtained and reviewed OFR and GPO plans and related material, informal minutes of ACFR meetings, notes from ACFR standing subcommittee meetings, and various OFR and GPO publication statistics. We analyzed the number of agency FR documents submitted in electronic format using data from OFR's manual logs. We did not verify the accuracy of the publication statistics or OFR log entries.

We also reviewed a 1990 management study of OFR operations done by NARA's Policy and Program Analysis Division. The study encompassed all OFR operations and included 93 recommendations. As we did our work, we determined that this study was still applicable to many OFR operations and drew upon it for our work.

For guidance in evaluating automation efforts, we used previous OFR and GPO automation plans, applicable laws and regulations, federal standards and guidelines promulgated by the Office of Management and Budget, and our previous reports on the use of information technology in government agencies.

Our review was done primarily in Washington, D.C., between May 1991 and August 1992 in accordance with generally accepted auditing standards. We discussed our findings with officials from OFR, NARA, and GPO on September 25 and 29, 1992, and included their views in the report where appropriate.

Increased Automation in Producing the Federal Register Could Reduce Costs and Improve Operations

A key to improved automation of the FR and CFR depends on agency submission of FR documents in electronic format. OFR and GPO have recognized the importance of obtaining agency documents in machine-readable format and have encouraged agencies to do so. GPO offers agencies a 30-percent discount from its publication charge if agencies submit electronic format FR documents with the GPO typesetting codes correctly inserted. If one-third of the pages published in the FR in 1991 had been submitted in electronic format with the typesetting codes, agencies could have realized discounts of approximately $2 million. However, agencies make little use of this discount because they believe the costs to develop the coding capability exceed the discounts offered.

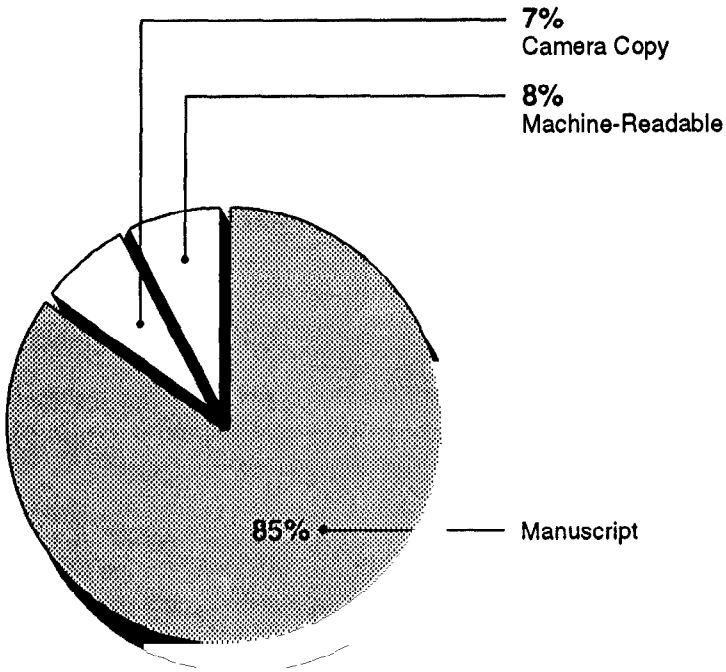
Most FR pages published are rekeyed or scanned into electronic format at GPO from manuscript. Since most federal agencies already have the documents in electronic format, GPO's process of rekeying or scanning documents duplicates agency keystrokes, can introduce errors, and requires additional proofreading. Composition costs, such as GPO's 1991 keyboarding charges of approximately $4.3 million, could have been reduced and the publication accuracy improved if more agency FR documents were submitted in electronic format.

Many FR Documents Are Rekeyed

Although options exist for the submission of electronic documents, most FR documents are currently processed exclusively on paper until GPO's composition operations. At OFR, editors use paper copy to note their revisions and modifications to documents. When documents reach GPO, the manuscript is converted to electronic form except parts that agencies request to be processed as camera copy or that are graphic in nature.

During 1991, the FR published 30,942 documents with 57,975 pages. As shown in figure 2.1, about 85 percent of the pages published were processed in manuscript format. Agencies prepared about 8 percent of the pages published in a generic word processor format and inserted the appropriate GPO typesetting codes. These coded electronic documents, which are typically submitted on disk to OFR, represent about 4 percent of the documents processed through OFR. The remaining 7 percent of the pages published were photographed directly for publication.

Figure 2.1: FR Pages Published in 1991 by Type of Processing



According to GPO, about 40 percent of the manuscripts processed are optically scanned, and the rest are keyed. GPO composition staff check the electronic file created from optically scanned manuscript for errors and corrections and key in typesetting codes. If the manuscript GPO processes is keyed, GPO composition staff mark the necessary typesetting codes on the paper before sending it to the keying unit.

Each document GPO keys or scans must also be proofread for accuracy. Rules and proposed rules are proofread twice. In most instances, GPO is duplicating the process that the agency went through when it created the document. In addition, the process of converting the documents to electronic format can introduce errors. Although GPO proofreads the documents, errors sometimes occur. According to OFR officials, errors have included missing text, misspelled words, and text that is out of order. For coded electronic documents, however, many of these keying/scanning, copy markup, and proofing activities are not necessary. Coded disk documents are incorporated into the GPO composition process when final page proofs are prepared.

GPO bills agencies $375 per page to publish in the FR. In 1991, agencies spent about $21.5 million to publish their FR documents. Of this amount, GPO composition charges for processing the majority of documents in manuscript format were around $9.3 million—about $4.3 million for keyboarding and about $5 million for proofreading and copy markup.[2]

GPO offers agencies a $111-per-page (30-percent) discount as an incentive to submit fully coded documents. In 1991, agencies realized discounts of about $454,000 by submitting coded electronic documents. Although 11 agencies had submitted at least one coded document during 1991, three agencies accounted for 86 percent of the coded documents submitted. Given that most FR documents are still being scanned and rekeyed at GPO, composition costs could be reduced if obstacles to adopting the coded document program can be overcome or cost-effective alternative options are developed.

GPO's Coded Document Program Not Successful

Although GPO offers agencies a discount for submitting fully coded documents on a disk, this program has not been widely adopted. In discussions with officials at GPO, OFR, and agencies, we found that concerns raised during the planning and development of this approach were not adequately addressed and continue to limit its adoption.

In general, officials thought that the costs associated with developing and maintaining a coding capability were greater than the possible discounts. Among the more specific reasons identified for not adopting the program were the following:

- coding was too difficult to learn;
- retaining trained staff was difficult, especially if they were lower grade clerical staff with a high turnover rate;
- higher grade level staff are needed to do the coding competently;
- coding would require establishing a separate, centralized unit because document drafting is done in too many different offices to make training and installing the necessary equipment feasible;
- the process is too time-consuming and document drafters do not have time to do the coding; and
- the agency does not publish enough in the FR to generate discounts sufficient to justify the cost of equipment and training or to maintain the coders' skills.

[2]These figures are based on time charges of GPO units composing the FR. Charges to key document text are not separable from keying typesetting codes.

Similar concerns were raised in a 1984 OFR task force report exploring the potential for machine-readable documents. The report noted agencies were interested in submitting electronic documents and GPO was interested in converting agency word processing files for its composition system. The report pointed out that agencies cited accuracy as a benefit from not having GPO rekey documents and that GPO's benefits included eliminating manuscript markup and keyboarding as well as reduced printing costs. It identified agency support for software that would translate at least some word processing codes to GPO typesetting codes but negative agency reaction to inserting GPO's codes. Agencies indicated that coding would be too labor-intensive for FR liaison staffs and impractical for many offices originating documents. One agency said it might develop the coding function provided there were sufficient economic incentives.

After presentation of the report, in 1985 the ACFR directed its standing subcommittee to plan for greater automation technology use in producing FR publications. The subsequent plan included two pilot projects for the routine acceptance of machine-readable FR documents. In one approach, agencies would submit FR documents in their standard word processor format and GPO would convert the word processing codes to typesetting codes. In the other approach, agency personnel would add the typesetting codes to documents before submitting them to GPO.

In a progress report later that year, the ACFR subcommittee concluded that it would be unrealistic to expect agencies to insert GPO typesetting codes into the word processing files, but that the alternative approach would increase GPO's workload by requiring GPO to develop translation programs for each word processing program. GPO procured equipment to do this translation, but it proved to be slow and of limited usefulness. GPO then proceeded with the approach that agencies would insert the typesetting codes into the document before submitting the file. Between 1987 and 1989, five agencies experimented with preparing and submitting coded electronic documents after GPO offered a 20-percent discount on the FR page rate.

When GPO completed converting its automated composition software to run on a PC in 1989, OFR and GPO approached the Office of Pesticides and Toxic Substances (OPTS) of the Environmental Protection Agency (EPA) to field-test this software. The PC software, called Microcomp, allowed agencies and OFR to produce typeset FR page proofs on a laser printer to see what the printed page would look like rather than first having to send

GPO the electronic document. OPTS then began submitting FR documents prepared with Microcomp. In 1991, OPTS, a major preparer of coded documents in GPO's program, reported submitting 495 documents and accruing discounts of almost $161,000.

To expand the pilot project, EPA, GPO, and OFR briefed about 40 agencies on the results of the pilot project in July and October 1990. GPO also notified agency printing officers of the program and raised the discount to 30 percent. Since then, growth in the number of coded documents submitted has been slow. OFR's quarterly reports since 1990 noted that the requirement that documents be fully coded to obtain the discount would continue to be an obstacle. One report stated that agencies continued to inquire about procedures for submitting disks, but most were not interested in adding typesetting codes.

GPO officials acknowledged that the program has not been well received. They said, however, that it is the best way for agencies to save money. GPO added that the alternative approach of converting electronic documents in word processing formats to coded typesetting files is difficult to fully automate given the variety of word processor programs used and the different ways typists can achieve the same format. For example, typically a typist can adjust the left margin with "tab," "indent," or "margin set" commands. The text looks the same, but the embedded word processing codes are different. Since conversion programs cannot anticipate and address all these possibilities, conversion of an electronic document with word processing formats to a coded document requires manual intervention and verification by GPO staff.

Operation of the program substantiates some of the 1984 concerns. According to agency staff familiar with the coding process, coding is not too difficult for staff at all levels to learn. However, they said staff need to do the coding regularly to maintain their skill level. Further, they said the loss of trained staff has disrupted agency submissions of coded documents in some cases. OFR and GPO officials said that some material, such as complicated tables and equations, can be difficult to code.

Coded Document Program Needs Further Development

If preparing coded electronic documents is to attain wider agency adoption, GPO should better promote the program, change the discounts offered, and reassess submission requirements. Agencies could reexamine their document preparation procedures.

GPO should consider doing more to promote the program with agencies. GPO efforts to promote the program after the initial briefings in 1990 were minimal. Some of the FR liaison officers we surveyed either didn't know about or were misinformed about the size of the discount being provided. In addition, 11 of the 18 liaison officers said a user group or newsletter would be helpful for agencies considering, learning, or doing coding.

The EPA official who heads the OPTS FR unit said a larger incentive was needed and pointed out several problems with the current discount arrangement. He said the discount is not related to the level of effort or difficulty involved in coding a document. He said that 80 percent of EPA's savings were achieved by coding about 25 percent of the agency's FR documents and that except for the difficulty of maintaining staff technical competence, the unit could be operated more efficiently by coding a few long documents. He also noted that if an agency coded documents that were long and also had complex tables or other contents that were difficult to code, a few errors could jeopardize the whole discount. Three of the FR liaison officers we surveyed expressed similar concerns.

The EPA official also said that agencies needed a centralized coding unit and a sufficient publishing volume to maintain coder competence and generate savings that justify agency investment of resources. OFR and GPO personnel made similar observations. The EPA official also said that while the 30-percent discount does not offset his unit's costs, the coders also do other editing and regulatory liaison activities. He cited improved accuracy and more centralized control over the agency's documents as additional benefits. The EPA experience suggests that other agencies may want to consider a centralized coding function.

Existing Options for Submitting Electronic Documents Should Be Used More

Even with further development of the coded disk document program, agency adoption of this approach may be limited. Other options for submitting documents in machine-readable form should be encouraged. A 1988 ACFR standing subcommittee report recommended that no one specific method be prescribed for agencies to use when submitting FR documents. The report stated that GPO could offer a variety of methods and page rates so the publishing agencies would be provided an economic incentive to use the method or methods which best serve them.

Although GPO has not given OFR or the agencies any formal guidance concerning the submission of electronic documents in other formats, GPO has received and processed some usually long agency electronic

documents in a generic text format or produced by commercial word processor programs.[3] GPO can translate documents produced on some widely used word processing programs to a document file. The process requires removing embedded word processing format codes to create a generic text file and then inserting GPO typesetting codes. Much of this can be done automatically if GPO has a program to take out the embedded word processing codes. However, the file still needs to be checked to correct and possibly complete whatever the automated programs miss.

When we discussed increased use of this approach with GPO officials, they said they find it desirable to have an electronic version of the document submitted along with the paper as long as they could use either one. They said the paper copy was needed if the file could not be processed, but they preferred an electronic version if it was usable. GPO said that, for some long documents, they would try to get the agency's electronic file of the document.

GPO officials said processing a word processed file saved GPO from rekeying the text, but GPO still had to add typesetting codes and proofread the document. Depending on the time and effort it takes to convert from word processing format to a coded typeset file, the only advantage to using the electronic file may be improved accuracy. GPO officials said short documents and those with tabular material could be marked up and rekeyed more efficiently than going through the conversion process. However, GPO officials said they had not determined the specific document length or circumstances where rekeying was likely to be more economical than document conversion.

GPO officials said that to make greater use of this option agencies would need to adopt and follow some prescribed standards to assure consistency in preparing document files. They said that offering a discount for a word processed electronic document would be problematical if GPO decided not to use the file due to technical problems or for processing efficiency. Given a choice between having a document submitted in its word processed format or as a generic text file, GPO officials said they would prefer the generic text format with limited format conventions. Because most word processing programs can convert their files to a generic text file, many agencies could provide a document in this format. Fourteen of the 18 FR liaison officers said their agencies have this capability.

[3]A generic text file is a file that consists of only universally accepted ASCII (American Standard Code for Information Interchange) characters.

Agency submission of electronic documents in either word processing or generic text formats could be used to reduce the costs associated with GPO's scanning and duplicative rekeying of documents. Using this approach efficiently will require that reasonable standards for preparing the documents be established, such as restricting the submissions to generic text files or those word processing files that GPO is best equipped to convert. This approach will also require that GPO determine the document length, content, and accuracy factors that would have to be specified for submissions to receive a discount. Agencies would have to establish adequate document processing controls to assure the correct electronic document is submitted.

Additional Options Being Developed for Submitting Electronic Documents

Our review prompted the OFR Director in September 1991, under the auspices of the Archivist, to establish a task force to increase the number of FR documents submitted in electronic format. The task force included representatives from GPO, the Internal Revenue Service, the Nuclear Regulatory Commission, the Health Care Financing Administration, the Department of Education, and NARA.

Under the task force's approach, FR documents are prepared with WordPerfect, a popular word processing program, using a series of automated templates and programs created by GPO.[4] These templates and programs assist agencies in preparing documents so that agencies can do more of the conversion from word processed format to typesetting codes automatically. An advantage of this approach is that agencies do not need to learn GPO typesetting codes but can use word processing software with document tags to prepare an electronic document with typesetting codes. If a document can be fully converted using the templates, the agency can use GPO's Microcomp publishing software to verify the coding and submit the coded file for the 30-percent discount.

The level of participation in this project varies, and it is too early to tell if it will succeed. In March 1992, OFR summarized progress on the project and identified needed requirements for the project to proceed. At that time, agencies had worked with the templates on test documents. Only one document had been processed through GPO for publication by June 1992.

[4]The templates and programs use English language tags to identify the various parts of the documents. For example, the tag <AGENCY> is used to identify the agency preparing the document and <SUM> identifies the summary section of the document. Other programs convert the documents to the proper format and add typesetting codes based on the tags. At this time, the templates and programs are under development and do not provide agencies with all the tags they might need for a document.

ACFR, at its last meeting in June 1992, directed its standing subcommittee to report quarterly on this project.

Use of Telecommunications in the Publishing Process Needs to Be Developed

OFR and GPO have shown a long-standing interest in being able to use telecommunications in publishing the FR and CFR. Likewise, agencies have indicated a continuing interest in being able to submit FR documents using telecommunications. OFR routinely sends and receives about 1,000 pages of FR manuscript each day. Agency documents, including coded disks, are often delivered by messengers who also regularly travel between OFR and GPO throughout the day delivering documents, disks, and magnetic tapes. In addition to reducing the costs of messengers, the development of a telecommunications capability could reduce the need to verify and update duplicate paper copies of FR documents as OFR processes them.

According to a GPO official, linking OFR and GPO with a leased dedicated telecommunications line was considered as early as 1980. In 1981 a line was installed between OFR and GPO as an operational test. The concept proved unworkable because the communications process disrupted normal production operations, there were errors in the transmitted data, and the transmission line was considered too costly.

The 1984 OFR task force report on machine-readable documents identified agency interest in telecommunicating documents to OFR. The subsequent 1985 ACFR plan for machine-readable documents proposed telecommunications pilot projects and development of long-range capabilities. The 1990 NARA management study of OFR likewise recommended a pilot program for electronic transmission and that OFR work with GPO to develop plans and cost estimates for the routine transmission of documents. Six of the agency FR liaison officers we surveyed said they would like to have a telecommunications option.

While there have been some limited document telecommunications between agencies, OFR, and GPO, previous proposals were not fully implemented. A routine telecommunications capability for FR/CFR production has not been established. A GPO official said that a direct connection with OFR's computer systems remained impractical until recently. Since OFR moved to a building across the street from GPO in July 1992, a GPO official said they now plan to use laser technology to provide a high-speed data link between OFR's PC-LAN and GPO's systems. Previous GPO plans called for using dedicated fiber optic line, but the cost for this was considered too high.

Once installed, a high-speed data link will enable OFR and GPO to reduce the current level of magnetic tape and disk transfers. It will also increase the potential for agency submission of FR documents by electronic transmission because GPO's telecommunications capabilities could be used to receive agency submissions and the high speed data link could be used to send documents to OFR. OFR and GPO have been discussing procedures and responsibilities that would define how they would obtain and process such documents. OFR staff expressed concern about security and the need to ensure that OFR has control over material until it is released to GPO for printing.

The adoption of telecommunications technology for submitting agency FR documents must also address concerns about unauthorized modification of documents, premature release of documents, and elimination of paper copies. It will require that OFR, GPO, and agencies develop methods and procedures for such things as the use of electronic signatures, document control and verification, and file security.

Besides such procedural and technical matters, certain statutory and regulatory provisions governing agency FR submission requirements will also have to be considered. Previous OFR analyses of these provisions—which include requirements for a signed original document, submission of a certain number of original or certified copies, document availability for public inspection, and document archiving—indicated that they can be handled through changes in regulations.

Conclusions

We believe that submission of electronic FR documents would increase if agencies could submit documents in alternative formats. Alternative approaches, with standards and guidance on how and when they would be used, could increase agency submission of electronic documents and reduce publication costs and errors. Savings would come from reducing the amount of GPO rekeying or scanning of manuscripts. Much of this activity duplicates agency efforts and introduces potential errors into document processing.

Although GPO's coded document program provides agencies with a discount incentive and minimizes introduction of additional errors, it requires that agencies adopt GPO composition functions that may not be cost-effective. While further efforts to develop the program could increase its use, many agencies may not adopt it.

Alternatives already exist, but guidance for their use has not been developed or promoted. The template pilot project represents a step towards the systematic use of word processed files, but further development is needed to ensure its usefulness. If standards were developed and followed in preparing and submitting documents in word processed or generic text formats, the reliability of the conversion process could be improved and GPO could establish page-rate discounts for such documents.

The 1985 ACFR plan for submitting machine-readable documents had an objective of evaluating and comparing the workload, timeliness, and accuracy involved in processing electronic documents, as well as paper. This objective should be an integral part of the planning and development of alternative options for electronic document submission to assure that each option is used in situations where most effective and efficient. Developing alternative options should also consider agency methods for preparing FR documents, the cost of implementation, the ease or difficulty of learning to use it, and the support OFR and GPO can provide.

Recommendations

We recommend that the Chairman and members of ACFR increase agency submission of FR documents in electronic format by (1) working with agencies to further develop and expand the electronic submission options available, (2) doing necessary analyses to establish the conditions and circumstances for efficient use of these options, and (3) addressing the technical, procedural, and legal matters that must be resolved in order to establish telecommunications as a method for agencies to transmit their FR documents.

Agency Comments

GPO, OFR, and NARA officials generally agreed with these recommendations. GPO said the 30-percent discount for submitting a coded document is commensurate with the savings GPO realizes from not having to do that work. GPO said that they could not offer agencies a larger discount and that agency coding costs would probably be greater since agency operations are less centralized than GPO. OFR and NARA officials agreed with GPO. GPO also pointed out that (1) the $375 page rate charge must also cover the cost of printing and distributing over 11,000 FR copies that are provided without charge for official purposes and (2) even with a document that an agency coded, GPO still incurred some composition costs such as assembling the FR documents into the daily issue.

We agree that agency costs for document coding may not be totally offset by the 30-percent discount unless agencies can centralize their coding operations. Because this may occur only at agencies with high volumes of FR publishing, we recommend that alternatives for electronic submission be developed that are less costly for agencies to implement and are more in accord with their document processing procedures. While some alternatives may not reduce GPO's composition work significantly, they would nevertheless reduce duplicative rekeying or scanning of document text and the resultant errors.

NARA officials also said that GPO has been hesitant in the past to consider alternatives to agency coding of disks. NARA officials attributed this to GPO's desire to keep the flexibility it now has to keep its workforce busy. NARA said, for example, that when agency submissions include word processing disks, GPO decisions on whether to use the disks or rekey text were primarily based on the availability of GPO keying staff. That is, if staff were available, the text would be rekeyed and if staff were not available, GPO would use the agency's disk. Because determining GPO's fluctuations in workload went beyond the scope of our review, we did not substantiate NARA's view in this regard.

Electronic Dissemination of Federal Register Publications Is Limited

Although the expanding use of computers, networks, and related information systems has made it possible to send and receive information in a variety of electronic formats, the availability of an electronic format FR from the government has been limited to magnetic tapes. These tapes, which do not contain the graphics and some other material that appears in the printed version of the FR, are purchased by private sector vendors who produce and resell the FR in electronic formats such as CD-ROM and on-line.

OFR and GPO have used pilot projects and are developing additional electronic dissemination initiatives, but these efforts are limited and should be better coordinated to ensure that dissemination efforts are not duplicated. Assessment of user interest in various options has been limited. Graphics technology, now being used on a GPO bulletin board dissemination initiative to provide users with complete publications, could also be used to provide more FR material on GPO's magnetic FR tape.

Past and Current Electronic Dissemination Efforts

GPO and OFR have collaborated on pilot projects testing certain electronic dissemination formats. They have provided useful information, but there has been no ongoing, sustained effort to further develop them. Some of these projects will continue and new projects started as a result of an ACFR June 1992 recommendation that directed OFR and GPO to determine the feasibility of publishing and disseminating publications in electronic format.

An ACFR 1985 plan outlined several machine-readable document capabilities and procedures for further development, including an up-to-date CFR version for on-line dissemination. An earlier OFR task force report on the potential for machine-readable documents noted agency interest in access to an updated CFR.

An up-to-date CFR version was developed in about a year. By 1988, OFR could provide agencies electronic copies of current CFR volumes in several different formats on tape and disk. However, the next phase of work, requiring further restructuring of the database, developing software, and purchasing equipment needed to provide an on-line dissemination capability, was not undertaken. According to OFR's Director, part of the reason for not proceeding with the on-line version was that several private sector companies were producing on-line CFR versions and the administration's policy of reliance on the private sector for dissemination

in accordance with the Office of Management and Budget Circular A-130 in effect since 1985.

A 1990 NARA management study of OFR recommended that automated data processing (ADP) plans include bringing CFR text on-line to assist FR editors. While OFR continues to provide agencies with electronic extracts of the last annual print version of their CFR volumes upon request, OFR no longer maintains an up-to-date CFR version. The last annual print version of all CFR volumes is available to agencies for a fee from JURIS, a Department of Justice on-line computer system.

Between 1988 and 1989, GPO operated a pilot project using FM radio broadcast transmission to disseminate the FR. In 1991, GPO identified daily satellite broadcast of government information in its strategic vision statement, GPO/2001: Vision for a New Millennium, as an electronic dissemination capability it intended to develop. Although subsequent GPO work addressed some of the issues and problems GPO identified in the FM transmission pilot project, other matters that would also apply to satellite broadcast, such as customer interest in this service, have not been addressed.

In November 1991, GPO and OFR collaborated with the Health Care Financing Administration (HCFA) on a pilot project to produce and sell one of HCFA's FR documents on disk. HCFA wanted to provide an electronic version of its Medicare physician's fee schedules so that health care providers could directly calculate reimbursement rates. This project required a special GPO development effort outside of routine production processes. The initial production run of the disk sold out and additional production runs were needed to meet customer demand.

A GPO official said that, although the HCFA disk project was considered a success, several issues would need to be addressed before machine-readable FR documents could be made regularly available. Concerns included such things as establishing costs associated with production of electronic publications, who would pay the costs, who would set the publication price, and whether electronic documents would be considered official.

Work on using disks to disseminate FR documents is expected to continue. A GPO official said the HCFA disk project was a good demonstration of the need and market for documents in machine-readable format. OFR has been assisting GPO in identifying other FR documents that might be suitable for

distribution by disk. ACFR recently identified disk distribution as one of three electronic format projects to develop.

One of the other two projects ACFR identified was a study of user interest and feasibility of providing another OFR publication, the United States Government Manual, on CD-ROM. The third project was establishing an OFR bulletin board that would have the FR daily table of contents to inform the public what documents would soon be appearing in the FR.

GPO also recently initiated an electronic bulletin board to make agency material including EPA's FR documents and CFR volumes available. This was in response to an EPA request, independent of the ACFR project recommended at OFR. Users are charged for downloading files from the board based on the amount of material downloaded. There is no charge for browsing the board. When fully operational, the GPO bulletin board will also contain files of other EPA publications such as the Toxic Release Inventory and material from other agencies including some of their FR documents. Files on the bulletin board will include associated graphics. In addition, the bulletin board will be used to announce and promote GPO products. A GPO official said GPO is working to get other agencies to place material on the bulletin board, including their FR documents and CFR titles. She said that GPO was also interested in including a listing of the FR table of contents that would be available at no charge.

Because GPO's bulletin board could potentially provide the same or similar information as contemplated by OFR's proposed bulletin board, ACFR should be involved in these projects. OFR and GPO should explore the cost efficiency of having one bulletin board relative to the benefits of having two. OFR's Director characterized the GPO bulletin board as a developmental effort. The Director said that questions on the project's cost need to be addressed and that policy decisions need to be made concerning who will be responsible for putting FR/CFR publications on the bulletin board and when volumes would be available.

The issues being raised in developing these bulletin boards are some of the same electronic dissemination issues identified in the 1984 OFR task force report on machine-readable documents. For example, that report noted that management decisions needed to be made on who will provide electronic services, what would be available, when, and at what cost.

Need to Identify User Needs

In June 1992, ACFR directed OFR and GPO to identify user needs as part of their study of disseminating ACFR publications. Because some markets for electronic FR products are being served by private sector vendors, information on user needs can be crucial for developing cost-effective electronic products.

OFR and GPO have recognized the need for obtaining market information, and each has done informal, small-scale studies. Since February 1992, OFR has distributed questionnaires to participants at its public workshops on the FR and also at a meeting of law librarians. For a 12-week period in 1991, persons calling OFR and inquiring primarily about the availability of FR publications electronically were asked about the formats they were interested in and for what use. During this survey, OFR documented 17 calls from the public. Callers who would not identify themselves for possible follow-up or who discussed other matters in addition to electronic formats were not included. In November and December 1991, GPO surveyed 32 Los Angeles area FR subscribers by telephone to explore their interest in an electronic version of the FR.

Respondents in the two studies showed no strong or consistent preference for any specific electronic dissemination format. However, the information these studies provided about user interest in FR/CFR electronic publications was limited by their small sample sizes and methods used to collect the data.

These studies did not adequately address certain fundamental questions such as the following:

- What electronic products would be of most interest to users?
- What is the size of the user group or market for a particular electronic product?
- What price would those users be willing or able to pay for the product?

Additional well-designed studies involving more FR and CFR users, including other federal agencies, are needed to produce market information that can be reliably used to guide development of electronic publications. Better information about user interest in specific electronic products should also be included in pilot projects. GPO's HCFA FR document disk and bulletin board include files that request users to provide feedback to GPO on these electronic products. These efforts should be continued and improved to collect better data on user interests.

Graphics Capabilities Should Be Used More

GPO's report, GPO/2001: Vision for a New Millennium, said an expanded capability to incorporate images and graphics will occur with the increasing use of electronic formats. A GPO official said that GPO has developed the capability to include electronic graphics in publications but has not been asked to include them in FR publications. He also said that once the FR publishing system was converted to Microcomp and a standard graphics format was established, GPO could import agency graphics into the printing process.

GPO's FR magnetic print tapes and the electronic products that several private sector vendors develop from them usually do not contain all of the material that appears in the printed FR version. The GPO tapes omit material such as illustrations, maps, drawings, and some mathematical formulae. Such material is not composed electronically or included on the print tape but is photographed off an original or camera-ready copy. Any other material that is printed from camera-ready copy at the request of the agency submitting the document is also not included on the tape.

One private sector vendor said that use of its FR database increased after it started including some of the missing material from the GPO print tape. If GPO included graphics in the FR database, missing material could be included on the tape. GPO could also use graphics capability to import tables that are not keyed or provided in machine-readable format. If this technology can be cost-effectively used in preparing the print tape, end users of electronic FR products would have access to more complete information than what is available to them now.

Conclusions

OFR and GPO are developing electronic dissemination of FR publications, but few FR publications are generally available electronically. Recent pilot project efforts have explored certain options for electronic dissemination. However, separate OFR and GPO development of the bulletin board projects may result in duplication or wasted effort.

Moreover, OFR and GPO have not systematically collected or analyzed data that show what electronic products would be of interest to both federal and public users, how many users would like those products, and whether products could be cost-effectively produced in response to those needs.

The pilot project approach to electronic dissemination of the FR and CFR provides a way to incrementally investigate the technical viability, costs, benefits, and customer responsiveness of a particular dissemination

alternative. But the usefulness of this approach to guide further development of dissemination technologies will partly depend on how well the evaluation components are designed. Past projects have not been consistently designed to provide much useful information.

Further, while the technology exists to incorporate graphics and other material now missing from electronic versions of the FR and CFR, they are not included because GPO has not been asked to include them. However, OFR and GPO do not know if users would like this information included or whether it would be cost-effective.

Recommendations

We recommend that the Chairman and members of ACFR obtain more complete information about federal and public interest for electronic FR and CFR publications including the need for and cost of providing a graphics-enhanced FR magnetic print tape. ACFR should require that electronic dissemination pilot projects be designed to provide useful information on costs, benefits, and the ability to meet user needs. ACFR should also assure that both the GPO and OFR bulletin boards are necessary and not duplicative.

Agency Comments

Although GPO officials did not object to our recommendations, they pointed out that GPO is a service organization and responds to agency interests. GPO said that agencies, as publishers, should determine what users want. We believe that the public printer's membership on ACFR requires that GPO go beyond its usual role and be more involved with determining user needs.

NARA and OFR officials generally agreed with our recommendations but pointed out that the bulletin boards are presently different. They said GPO's board is used as a means to distribute both FR and non-FR documents, while OFR's board provides information services about OFR publications. They said that separate bulletin boards may be appropriate initially and might be combined later. We continue to believe that ACFR should determine if both bulletin boards are necessary and do not duplicate each other.

Strategic Plan Needed to Guide Use of Information Technologies

Efforts to incorporate information technologies into FR and CFR production and dissemination have been limited and hampered by inadequate planning and coordination that have resulted in additional costs, delays, or suspension of projects. If current and future automation efforts are to be economically and technically optimal and progress made in using electronic technology to produce and disseminate the FR, planning and coordination need to be improved.

Inadequate Planning and Coordination Has Hampered Some Automation Efforts

Closer coordination in the early stages of the planning process and better assessment of potential automation benefits, costs, and needed resources could have made the development of some FR electronic technology projects more efficient and avoided delays.

For example, in 1988 OFR initiated a project to develop an FR document tracking system. As part of its development, OFR contracted with the Navy Regional Data Automation Center (NARDAC) for a requirements analysis, feasibility study, and initial systems design. The NARDAC feasibility study proposed installing a LAN that conformed with NARA guidance and standards to support the document tracking system. Compatibility with GPO systems was not in the NARA requirements for the feasibility study. When GPO became aware of the plan, GPO questioned whether the proposed LAN would be compatible with its network. GPO offered and subsequently installed an alternative LAN that would forestall any compatibility problems. However, this change in the LAN required further OFR work to identify compatible database software that could be used for the document tracking system.

It took another year to review and evaluate possible database programs and install a prototype version of the tracking system using the selected software. According to OFR's Director, after the prototype tracking system was demonstrated, further development of the system was limited. Work on the system was slow and limited because planning did not adequately assess the capabilities of available technical staff to develop it while attending to other duties such as systems maintenance, training, resolving unexpected technical problems, and responding to requests for assistance. Staff assigned to develop the tracking system had little prior experience doing this type of database programming.

A 1990 NARA management study raised several concerns about the adequacy of the planning for the tracking system and the time it was taking to complete. One concern was the absence of a cost/benefit analysis

assessing the burden on the staff to maintain the system relative to its benefits. During the system design and review, neither OFR nor NARA explored opportunities to provide management information about the FR document workload. Ways to increase the value of the database were deferred as a future development, dependent upon the availability of time and staff.

When the Director became aware that certain commercially available software packages could support document indexing and tracking, work on the prototype system was discontinued. The Director worked with NARA ADP acquisitions staff to procure this software, which was successfully installed and is now used at OFR.

Efforts to obtain agency FR documents in electronic format provide other examples of the need for better planning. For instance, planning for GPO's coded document program, discussed in chapter 2, did not adequately address agency concerns identified in 1984 about coding FR documents. When the 1985 ACFR automation plan's other approach of obtaining and converting agency documents in word processor formats did not work out, no new plans or revisions to this approach were formulated until the 1991 template project was initiated by OFR.

Management Commitment to Automation Plans Has Not Been Sustained

Successful automation efforts require top-level commitment to information technology plans and periodic review and updating to ensure their usefulness. In recent years, the ACFR has not provided the continuing oversight needed to direct and support the FR/CFR automation initiatives proposed in its 1985 machine-readable document plan.

At a 1988 ACFR meeting, electronic dissemination was deferred as an agenda item for the next meeting, which was not held until June 1992. Further development of the CFR on-line dissemination component of the 1985 plan, discussed in chapter 3, was not addressed in 1988, nor did the ACFR update guidance on other automation projects initiated under the 1985 plan.

ACFR can provide the top management commitment needed to guide and sustain project efforts especially when difficulties are encountered that require policy decisions or the allocation of additional resources. Current and future automation efforts will require continued top management commitment and coordinated planning if they are to succeed. Previous discord over publication pricing matters and membership turnover has

contributed to ACFR's diminished role in guiding automation initiatives. ACFR's June 1992 recommendation to determine the feasibility of publishing and disseminating in electronic format indicates the ACFR may be resuming the role it established with the development of its 1985 automation plan. ACFR also directed its standing subcommittee to report quarterly on the progress of the template project.

No Strategic Plan to Guide Development of Automation

In previous reports on information technology issues, we reported that strategic planning ties an agency's information technology to its mission and that most successful automation efforts begin with top management having a clear vision of how an organization can benefit from information technology and a commitment to making this vision a reality through development of specific technology plans.[5] Strategic planning can lower the risks of developing inappropriate technologies or a collection of independent systems that are poorly integrated. A strategic plan can also aid in (1) identifying those critical automation capabilities needed to achieve production and dissemination objectives, (2) setting priorities on automation initiatives, and (3) developing budget requests.

OFR and GPO have no up-to-date, formally articulated plan describing the FR/CFR production and dissemination systems and technologies they expect to have in operation 5 or more years from now. OFR has not developed any long-term master plan for automating its operations. OFR's Director favors long-range planning but considers it difficult to do when the funding level beyond the current budget cycle is unknown and available resources must be used to support the office priority of issuing publications each day. OFR's 5-year ADP plan, limited to a general description of ongoing OFR automation activities, notes that GPO provides primary ADP support to OFR. GPO officials characterized their OFR ADP support as informal and said that they did not have a long-range plan specifying the automated capabilities they intended to institute at OFR.

In its strategic planning report, GPO/2001: Vision for a New Millennium, GPO presented some general guidance on the concepts, strategies, and objectives it intends to follow in planning future operations. The GPO report is intended as a strategic vision statement that will be realized through a series of tactical plans. It does not specify how or when these strategies or principles would be applied to the FR and CFR. GPO's tactical plans, now under development, are to be combined and condensed into a

[5]Information Technology Issues (GAO/OCG-89-6TR, Nov. 1988) and Meeting the Government's Technology Challenge: Results of a GAO Symposium (GAO/IMTEC-90-23, Feb. 1990).

strategic plan. Although some of GPO's tactical planning areas will encompass the FR and CFR and proposed hardware configurations for OFR have been produced, it is not clear that a consolidated, detailed plan will be prepared specifically for the FR and CFR.

Approach to Strategic Planning

Comprehensive quality management programs are based on principles that stress the importance of such things as

- identifying and meeting customer needs,
- fact- or data-based decision-making, and
- continuous improvement through analysis of previous action results to guide subsequent actions.

The approach taken to creating a strategic plan could further benefit from incorporating these quality management principles into the development process.

GPO's strategic vision statement, GPO/2001, identifies focusing on the needs of its customers—both agencies and information end users—as a key concept in defining its future. A plan based on customer interests is more likely to receive broad-base support. For example, agency input into the development of additional options for submitting machine-readable FR documents could improve agency adoption of procedures to provide their documents in electronic format. Further, collecting and analyzing relevant data can strengthen the case for allocating resources. By adopting a continuous improvement approach, there is increased assurance that plans will be updated periodically and that individual projects will be systematically assessed. The GPO/2001 report cites the need for a constant effort to improve the accessibility and usefulness of GPO products and proposes product improvement teams that come together to engineer product improvements.

Key Area for Strategic Planning

To achieve the most effective and efficient use of automation, one key area that strategic planning will need to address is redesign of publication functions, processes, and formats. The FR/CFR publication functions and tasks that agencies, OFR, and GPO do today are partly based on past printing technologies that may no longer be optimal. For example, GPO's rekeying or scanning of agency manuscript to get it into an electronic format duplicates work already done by the agency and adds a potential source of error and proofreading burden into the process.

The 1984 OFR task force report on machine-readable documents recommended that the entire publication process be examined in light of current technology and addressed in a comprehensive program design. To maximize use of machine-readable documents, it proposed reviewing all publication requirements, procedures, formats, and coding to see what could be eliminated or simplified. Such a comprehensive approach to automating the FR publication process is still needed. Instead of simply automating existing processes and procedures, decision-makers need to take a fresh look at alternative ways of accomplishing goals.

Redesigning the publishing process is likely to produce some shifting of functions. For example, agencies that code an FR document to obtain the 30-percent discount do many of GPO's normal composition functions. If OFR reviewed and edited these documents electronically and did whatever remaining coding is needed, GPO's role in the composition process would be reduced and the need to send GPO manuscript could be eliminated.

Some shifts in function are occurring at OFR and a few agencies with the processing of fully coded FR documents and development of the template project. As alternative methods for submitting machine readable documents are developed, this trend will probably continue. Such shifts in function may raise concerns about doing another organization's work and strain an organization's existing technical resources. Strategic planning is needed to identify and address these concerns. For example, both OFR and GPO may find that they need to expand their training and technical assistance functions to adequately support agencies in preparing machine-readable FR documents.

Conclusions

While OFR and GPO have individually and collectively undertaken various automation projects, they have no current, formal plan describing FR electronic production and dissemination systems they expect to use in the future. If the current approach to automating production and dissemination processes continues, information technology resources may not be efficiently used and progress will continue to be limited. The planning process needs to be strengthened and developed with input from all groups, including agencies and public users, that will be affected by the plan.

ACFR should develop a strategic plan that builds upon previous efforts and shapes the direction of future automation initiatives because it includes the top decision-makers who can provide the needed management

direction and commitment. ACFR's recent directive on the development of electronic initiatives, previous automation planning efforts, and authorization to prescribe regulations on how the FR is printed and distributed, make it a proper forum to fulfill this planning role.

Recommendation

We recommend that the Chairman and members of ACFR develop a strategic plan defining future FR/CFR production and dissemination processes and the electronic information technologies that will be needed to support those processes. Specific attention should be paid to identifying and addressing shifts in function that will occur in redesigning the processes by which the FR and CFR will be published.

Agency Comments

GPO, NARA, and OFR generally concurred with our recommendations. GPO agreed that the current arrangement of publication functions may no longer be optimal. NARA and OFR officials questioned whether it was appropriate for ACFR to engage in automation planning. They said that ACFR was established to carry out the Federal Register Act and that ACFR's past involvement in automation has been limited because it was not viewed as part of ACFR's mission. They suggested that changes in the production and dissemination functions could be addressed within OFR's and GPO's respective areas of responsibility. NARA officials also said that our recommendation for strategic planning would place new demands on ACFR and represent a change in its role. They also said that most changes would have to be made by GPO and it was not clear that ACFR's role was to interfere with GPO printing methods.

NARA officials also said that in view of GPO's historical resistance to change, they were not optimistic that ACFR would be successful in changing GPO's production of the FR and CFR.

We believe that because publishing the FR and CFR is a shared responsibility of GPO, OFR, and the agencies, automation planning should reflect the perspectives of the various organizations involved. Although we acknowledge that ACFR will have to take a more active role than it has in the past, ACFR is in a unique position to integrate the use of automation.

Matter for Congressional Consideration

Given the relative lack of action to date, Congress should consider holding oversight hearings to assess progress made by ACFR.

Agency Federal Register Liaison Officers Interviewed

Department of Agriculture

Agricultural Marketing Service

Department of Commerce

International Trade Administration
National Oceanic and Atmospheric Administration, National Marine Fisheries Service

Department of Energy

Department of Health and Human Services

Public Health Service, Food and Drug Administration

Department of Housing and Urban Development

Department of the Interior

Office of the Secretary
United States Fish and Wildlife Service
Office of Surface Mining, Reclamation, and Enforcement

Department of Labor

Department of Transportation

Federal Aviation Administration

Environmental Protection Agency

Federal Energy Regulatory Commission

Federal Reserve System

General Services Administration

Nuclear Regulatory Commission

Securities and Exchange Commission

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