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BY THE COMPTROLLER GENERAL RELEASED
**Report To The Chairman, Committee
On Interior And Insular Affairs
House Of Representatives**
OF THE UNITED STATES

NRC Should Specify User Needs And Improve Cost Control For Its Document Control System

The Nuclear Regulatory Commission (NRC) has invested about \$22 million in its document control system, designed to assist in accelerating the nuclear power plant licensing process and improve decisions related to nuclear safety. Although the potential benefits of the system are substantial, GAO observed that:



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- Less than half of NRC's staff is using the system and users are experiencing serious problems related to incomplete information, poor quality of system output, and operating procedures that are difficult to use.
- System costs have increased substantially and have not been adequately controlled.

The NRC, which followed acceptable contracting procedures in acquiring the system, has initiated or planned actions to make the document control system more responsive to its staff needs and improve controls over system costs. The Chairman of the Commission should direct the completion and implementation of planned corrective actions to specify the staff's needs for the system, resolve problems the staff is experiencing with the system, and prevent the processing of duplicative documents.



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

B-203360

The Honorable Morris K. Udall, Chairman
Committee on Interior and Insular Affairs
House of Representatives

Dear Mr. Chairman:

In your letter of September 19, 1980, you requested that we review the Nuclear Regulatory Commission's (NRC's) technical information and document control system. This automated information storage and retrieval system was developed to allow NRC staff to rapidly locate and examine information needed in regulating commercial nuclear activities. The system was designed to provide for better organization of and access to documents and to improve the completeness and timeliness of NRC's information. This letter briefly summarizes our conclusions and recommendations. The results of our review are provided in greater detail in appendix I.

Based on your request and subsequent discussions with your office, we focused our review on determining (1) the document control system's ability to meet the needs of NRC's staff, (2) the costs of the system, and (3) the adequacy of contracting procedures followed in acquiring the system. In making our review we confirmed the key findings reported in two recently completed NRC studies of the system's usefulness and costs. We also reviewed the contracting procedures NRC followed in acquiring the system. The details of our audit objectives, scope, and methodology are provided in appendix I.

In summary, we found that the document control system is being used by less than half of its potential users, NRC's staff is experiencing problems in using the system, and its costs have increased substantially beyond those NRC originally estimated. Although only a few contractors submitted a proposal for the procurement, our review also shows that NRC followed acceptable contracting procedures in acquiring the system.

Potential problems of system users usually can be identified and resolved through a comprehensive requirements study. NRC, however, did not conduct such a study to determine the specific needs of the document control system's users. We also found that NRC's staff is experiencing serious problems in using the system because:

- The system's data base is incomplete.
- The quality of document images displayed on video computer terminals is poor.
- Operating procedures for locating documents are difficult to use.

In response to the low level of system use and problems being encountered by system users, NRC has initiated actions to specify user needs and resolve the specific problems identified by the users.

In February 1978, NRC estimated that the document control system would cost about \$18 million for the first three years of its development and operation. Although NRC recently reduced its requirements for the system, NRC and contractor representatives currently estimate that the system will probably cost approximately \$22 million for the 3-year period. Most of the cost increases resulted from information needs associated with the accident at the Three Mile Island nuclear powerplant. Nevertheless, NRC could have reduced substantial system costs by using better internal controls to prevent duplicate information from being processed by the system. Also, costs might have been reduced had NRC used a more effective cost monitoring system to assure the appropriateness of system development and operating costs.

NRC plans to issue a recently developed directive in late May 1981 designed to prevent duplicate document processing. Also, in January 1981, NRC implemented a procedure for obtaining detailed, documented support for specific costs incurred by the contractor.

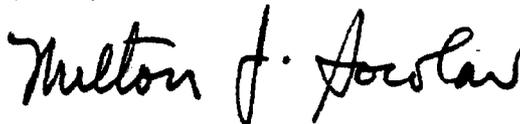
In acquiring the document control system, NRC obtained a delegation of procurement authority from the General Services Administration and advertised the procurement for developing and operating the system. Copies of the procurement specifications were sent to 92 prospective contractors. Proposals were received from three contractors and NRC determined that only one proposal was responsive to its procurement specifications.

NRC has initiated and planned corrective actions to make the document control system more responsive to its staff's needs and to improve controls over the system's costs. We recommend that the Chairman, NRC, direct the completion and implementation of planned corrective actions to:

- Specify the needs of NRC staff for an automated technical information and document control system.
- Resolve problems that NRC staff is experiencing in using the system.
- Prevent the processing of duplicate documents.

Since your office requested that we not delay issuance of the report, we did not obtain agency comments on this report. As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of its issuance. At that time, we will send copies to the Chairman, NRC, other interested parties, and make copies available to others upon request.

Sincerely yours,

A handwritten signature in black ink that reads "Milton J. Acosta". The signature is written in a cursive style with a large initial "M".

Acting Comptroller General
of the United States

NRC SHOULD SPECIFY USER NEEDS
AND IMPROVE COST CONTROL FOR ITS
DOCUMENT CONTROL SYSTEM

In June 1978, NRC awarded a contract for developing and operating an automated information storage and retrieval system. During the first 3 years of the system's development and operation, NRC and contractor representatives estimate that it will cost about \$22 million--approximately \$4 million more than estimated in February 1978. Many of the additional costs were beyond NRC's control; however, through better internal controls, certain costs would have been eliminated and others might have been reduced.

Despite NRC's substantial investment in the system, it is being used by less than half of its potential users. NRC studies and our work to confirm their findings show that users are not satisfied with the system because of the system's incomplete information, poor quality of output, and difficult operating procedures. Also NRC did not conduct a comprehensive requirements study in the early stages of planning the system. Such a study may have enabled NRC to identify and avoid potential problems of system users.

In acquiring the document control system, NRC followed acceptable contracting procedures. After soliciting contract proposals, NRC determined that only one of the three proposals submitted was responsive to the procurement specifications.

OBJECTIVES, SCOPE,
AND METHODOLOGY

In reviewing NRC's management of this system, we focused on (1) the document control system's ability to meet the needs of NRC's staff, (2) the costs of the system, and (3) the adequacy of contracting procedures followed in acquiring the system. In conducting our audit, we reviewed two recently completed NRC studies of the document control system. To expedite our review and avoid duplication of effort, we tested these studies to confirm their key findings on the level of system use and the problems NRC staff has encountered in using the system. We also interviewed NRC officials responsible for managing the document control system, NRC staff that use the system, and representatives of the system contractor, Teknekron Energy Resource Analysts (TERA) Advanced Services Corporation. In addition, we examined NRC policies, procedures, records, and other documents related to the system and observed system operations.

We also tested the completeness of information included in the system by attempting to locate documents that, according to NRC officials, should have been included in the system's data base. While our test was adequate to determine the completeness of the data base, we did not develop a statistical sampling plan for selecting these documents. The documents that we attempted to locate were either provided by the House Committee on Interior and Insular Affairs, selected from letters we sent to NRC during 1979 and 1980, or randomly selected, at our request, by two public utility companies from their 1979 and 1980 NRC correspondence files.

In examining the system's costs, we identified the major reasons for cost growth and reviewed the results of audits performed by NRC's Office of Inspector and Auditor and the Defense Contract Audit Agency. We also evaluated the adequacy of NRC's internal controls over the costs incurred by the system contractor. Although we identified certain costs that could have been avoided, we did not attempt to determine the appropriateness of all system costs.

In reviewing the appropriateness of contracting procedures used in acquiring the system, we examined applicable Federal procurement policies and procedures. We also examined NRC's contract files and procurement specifications and discussed the procurement with NRC contracting and management officials. At the conclusion of our audit we also met with NRC officials to confirm the accuracy of the information contained in this report.

NEED TO IMPROVE SYSTEM USEFULNESS

The document control system is designed to assist NRC in accelerating the nuclear power plant licensing process and improving decisions related to nuclear safety. The system provides a better means to organize and access documents and to improve the completeness and timeliness of information needed to regulate the nuclear energy industry. Its potential benefits are substantial. For example, in 1980 NRC estimated that, by fully utilizing the system, it could reduce operating costs by as much as \$20 million. This estimate was based on NRC's assumptions that up to 30 percent of the NRC staff's time is spent in retrieving documents and that an automated document retrieval system would be about 75 percent more efficient than a manual system. Based on recent NRC studies, however, all potential benefits are not being realized because most NRC staff members are not using the system.

Our review shows that NRC did not conduct a comprehensive requirements study to determine its specific user needs such as a detailed list of documents to be included in the system. According to NRC officials, user needs were determined in studies of other systems conducted between 1967 and 1976. Using these studies, NRC identified general system requirements, including the capability for rapid access to documents, a reduction in professional staff time spent performing clerical information retrieval functions, and a user-oriented operating procedure for document access and retrieval. However, the studies were not used for developing specific system objectives and data processing requirements to meet defined user needs.

We found that users are experiencing serious problems that may be contributing to low system use. User problems usually can be identified and avoided through a comprehensive requirements study. Because of user problems with the system, in November 1980, NRC's Executive Director for Operations established the Document Control System Policy Advisory Group. This Group is responsible for specifying system user needs and representing the users in NRC's system development deliberations.

Within the past several months, NRC has completed two studies of the document control system. In November 1980, NRC's Office of Management and Program Analysis reported that the system was being used by only about 26 percent of the NRC staff for whom it was designed. However, NRC's Office of Inspector and Auditor reported in March 1981 that the system was being used by about 42 percent of NRC's staff. Each of these studies solicited the views of NRC staff members to identify reasons that the system was not being fully utilized. Based on these studies, and our limited follow-up work to confirm their findings, major reasons for the low level of system use are that NRC's staff believes that (1) information in the system's data base is incomplete, (2) the quality of document images displayed on video computer terminals is poor, and (3) operating procedures for locating documents are difficult to use.

Our review confirms the system users' views that NRC's data base does not contain complete information. We tested the completeness of the data base by attempting to locate 96 documents related to nuclear power. Eighteen of these documents were provided to us by the House Committee on Interior and Insular Affairs, 30 were selected from our correspondence to NRC during 1979 and 1980, and, in response to our request, 48 documents were randomly selected and provided to us by two public utility companies.

NRC officials responsible for managing the document control system told us that each of the 96 documents is pertinent to NRC's regulatory responsibilities and should be included in the system's data base. However, based on our request for an automated search for these documents, NRC was able to locate only 40, or 42 percent, of the 96 documents. In discussing this with NRC officials, they acknowledged that the system's data base is incomplete and told us that the major reason is that documents received by NRC are not centrally controlled. That is, NRC's incoming mail is received at several locations, and it is difficult to assure that all pertinent documents are systematically forwarded to the system contractor to be processed and included in the system's data base. We found, however, that NRC has not provided to its staff specific criteria for determining which documents are pertinent and should be forwarded to the system contractor. Also, we found that the system's data base is not complete because, to reduce system costs, NRC decided not to include numerous documents that were written prior to September 1978 when the system became operational.

NRC's Executive Director for Operations recently has developed a draft directive that, when implemented, will provide specific and uniform guidance for identifying relevant documents. However, although NRC had originally planned to include older relevant documents in the data base, it has decided to abandon this effort to reduce system development costs.

We also performed a limited test that confirms the poor quality of computer terminal video images which makes them difficult to read as reported by the system users. NRC officials told us that, from the inception of the system, they were not confident that high quality video images could be provided by the computer terminals. Because of this, only 12 of the system's 44 terminals have been equipped with the video capability. As a result of the poor quality video images being displayed on the terminals, NRC currently is considering eliminating this capability completely.

The users also believe that a detailed understanding of the data base organization is required to locate needed documents effectively. NRC's data base has a hierarchical structure that provides for only one logical access path to the needed document. Information in other more user-oriented information systems can be located through the use of key words that are related to the subject of the needed document.

NRC currently is developing computer software to make the system more user-oriented. This software will consist of computer programs that provide a detailed set of instructions for more easily locating documents. Once implemented, it should enable NRC's staff to locate these documents through numerous logical access paths.

COSTS HAVE INCREASED AND HAVE NOT BEEN ADEQUATELY CONTROLLED

In February 1978, NRC estimated that the document control system would cost approximately \$18 million for the first 3 years of its development and operation. Based on NRC records, the current 3 year cost of the system, as it was designed in early 1978, would have been about \$24 million. We found, however, that NRC has scaled down the system. As a result, the estimated system costs for its first 3 years are about \$22 million--\$4 million more than originally estimated.

Although certain cost increases were beyond NRC's control, we found that NRC could have substantially reduced system costs by using better internal controls to ensure that the system did not process duplicate documents. Also, other costs may have been avoided by a more effective cost-monitoring system to assure the appropriateness of costs charged by the system contractor.

Because of time constraints on our review, we did not attempt to determine the actual causes of specific cost increases for the three year period. However, NRC records show that substantial cost increases are associated with the accident at the Three Mile Island nuclear powerplant. As a result of this accident, NRC (1) collected information from thousands of documents related to the powerplant and others of similar design and (2) acquired additional computer equipment to process the information. Costs were also increased because NRC decided to expedite the system's operations by acquiring additional computer equipment. As a result of the nuclear accident and NRC's decision to expedite the system, costs were increased by about \$3 million.

Additional expenses were incurred because NRC did not develop an adequate procedure for assuring that the document control system excludes duplicate documents. Thousands of duplicate documents have been submitted for processing to the system contractor. Although the contractor has been able to identify many such documents before they were processed, a large number of duplicates were identified only

after they were partially processed. For example, based on our sampling of the contractor's weekly reports we estimate that the system partially processed about 16,600 of them in 1980. NRC's Office of Inspector and Auditor estimated that the extra annual cost is approximately \$226,000.

To alleviate this problem, NRC recently developed a draft directive that, when implemented, should result in greater control over the processing of duplicate documents. Under this directive, NRC would designate one document as the original and direct its staff at various locations to provide only the original document to the system contractor. NRC's Policy Advisory Group for the system is currently reviewing the directive and the Executive Director for Operations plans to issue it in late May 1981.

System costs may have also increased because NRC did not implement a sound procedure for monitoring contractor costs until January 1981. Such a procedure enables NRC systematically to obtain detailed, documented support for specific costs incurred by the contractor. In monitoring the contract, NRC did compare actual and estimated system costs. They also identified significant increases in cost information provided by the contractor. Also, NRC has questioned certain costs and discussed them with the contractor to determine their reasonableness. However, NRC did not periodically analyze the costs or obtain written support for them.

To assure the accuracy of contractor costs, NRC has relied upon audits performed by the Defense Contract Audit Agency and NRC's Office of Inspector and Auditor. In July 1980, the Defense Contract Audit Agency completed a limited review of the contractor's overhead rates and no questions or unresolved items were found. While this review only covered overhead rates, NRC's Office of Inspector and Auditor performed a limited review of documents supporting the contractor's actual charges and in its March 1981 report questioned numerous costs amounting to approximately \$13,000. These costs included costs for first class airline transportation, employee luncheons, and employee reimbursement for travel expenses. Currently, NRC is determining the appropriateness of the questioned costs.

Although NRC has not provided appropriate control over the costs of the document control system, it has recognized the need for corrective action. In January 1981, NRC implemented a procedure of systematically reviewing system costs including an analysis of detailed cost data and supporting documentation. This procedure is an appropriate means to

help assure the accuracy and reasonableness of contractor costs for developing and operating the system.

ACCEPTABLE CONTRACTING
PROCEDURES WERE USED

In June 1978, NRC procured commercial services for developing and operating the document control system. We found that NRC followed acceptable contracting policies and procedures in making this procurement. Our review also showed that only a few contractors submitted contract proposals and only one of the vendors submitted a proposal that NRC determined was technically responsive to the procurement specifications.

As a result of an internal study, in early 1976 NRC concluded that an automated system was needed to improve the agency's control over nuclear related documents and provide NRC staff with a better means for storing and retrieving information. NRC's files show that a decision was made to contract for the system, rather than to develop it internally, because:

- To perform the work internally, NRC would need staffing increases that were opposed by the Office of Management and Budget.
- Purchasing existing hardware and software products would reduce the time and development costs required for the system.

In December 1976, NRC obtained a delegation of procurement authority from the General Services Administration to make a competitive procurement. Subsequently, NRC

- advertised the procurement,
- sent copies of the procurement specifications to 92 prospective contractors, and
- met with the 33 contractors that had expressed to NRC an interest in making a proposal for developing and operating the system.

Although numerous contractors expressed an interest in the document control system, only three of the contractors submitted a proposal for the contract award. NRC determined that only one contractor's proposal was technically responsive to the procurement specifications. After holding negotiations with this vendor, NRC awarded the contract in June 1978.

In discussions with us, NRC officials responsible for the document control system said that only one contractor met the requirements of all procurement specifications that are essential to NRC needs. Two such specifications were particularly difficult to meet. One of the specifications required contractors to demonstrate, through actual performance, that their proposed system could meet NRC's requirements. The other specification required that contractors have detailed knowledge of NRC's nuclear regulatory process. Our review of the contract files indicates that no prospective contractors took exception to the contract award.

CONCLUSIONS AND RECOMMENDATIONS

Less than half of NRC's staff is using the document control system, and system users are experiencing problems related to incomplete information, poor quality of system output, and operating procedures that are difficult to use. Because of the system's substantial costs and benefits, we believe that the attention NRC currently is giving to assuring its usefulness is appropriate.

Even though the requirements of the system have been scaled down during the first three years, the system's costs have increased by more than \$4 million. Many cost increases were beyond NRC's control; however, through better internal controls, substantial costs could have been avoided and other costs might have been reduced. Recent actions that NRC has taken to strengthen control over system costs should help to assure the economical development and operation of the document control system.

NRC followed acceptable policies and procedures in acquiring the document control system. NRC officials stated the system's procurement specifications were essential to meeting NRC's needs for technical information and document control, and that only one contractor's proposal met the specifications. Our review shows that prospective contractors did not question the award of the contract.

NRC has initiated or planned corrective actions to make the document control system more responsive to its staff's needs and to improve controls over the system's costs. We recommend that the Chairman, NRC, direct the completion and implementation of planned corrective actions to:

- Specify the needs of NRC staff for an automated technical information and document control system.
- Resolve problems that NRC staff is experiencing in using the system.
- Prevent the processing of duplicate documents.

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