BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Millions Wasted Trying To Develop Major Energy Information System

From the early 1970s through 1977, the Federal Power Commission invested millions of dollars in an unsuccessful effort to develop a large computerized system to improve Federal and State effectiveness in regulating the energy industry. After the Department of Energy took over the system in 1977, it invested another two years and more money but serious management weaknesses from the beginning kept the system from ever operating.

This report recommends that the Department of Energy (1) notify interested parties of the status of the failed system and (2) review its approach to system development to ensure that similar experiences and problems do not recur.

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

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To the President of the Senate and the
Speaker of the House of Representatives

This report summarizes our review of a lengthy and costly--but unsuccessful--attempt to develop a major Federal energy information system. Despite high expectations and the investment of millions of dollars, the system never operated as intended. We made this review because large amounts of Federal funds were spent on a system intended to serve important regulatory needs, and the system's results seemed suspect. We also wanted to identify the lessons learned from this system development experience which might be useful in developing other major Federal systems.

This report makes recommendations to the Secretary of Energy that are designed to ensure that interested parties are aware of the status of the system and to help ensure that similar experiences and problems do not recur.

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Energy; and the Chairman, Federal Energy Regulatory Commission.

Milton J. Socolar

Acting Comptroller General
of the United States

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DLG00487
AGC00257

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

MILLIONS WASTED TRYING TO DEVELOP MAJOR ENERGY INFORMATION SYSTEM

D I G E S T

Federal energy regulatory policies depend on the ready availability of current, accurate, and relevant energy information. In the early 1970s, the Federal Power Commission began developing the Regulatory Information System to improve Federal and State energy regulation by providing computerized access to current energy data. Some specific system goals were to

--save Federal and State regulators, as well as regulated industries, large amounts of money,

--improve regulatory effectiveness, and

--become a model for other agencies.

The Regulatory Information System--despite ambitious plans and an investment of many millions of dollars over nearly a decade--delivered virtually none of the benefits promised. When the Department of Energy decided in 1979 to cease investment in the system, they had few other options since the results had been minuscule and huge obstacles still prevented the successful operation of the system.

In October 1977, the Federal Power Commission's regulatory functions were transferred to the newly established Federal Energy Regulatory Commission. Many of its information functions were transferred to the Energy Information Administration. Until September 1979, both offices continued the system development effort started by the Federal Power Commission, with the Energy Information Administration having primary responsibility for further system development and the Federal Energy Regulatory Commission being the intended primary user of the system.

Federal offices did not separately account for all costs identified with the development and attempted implementation of the system. However, GAO identified over $26.5 million in such costs--some actual, some estimates--from the best available information. (See pp. 15-16.)

WHY DID THE SYSTEM FAIL?

Why was the Regulatory Information System unsuccessful? Evolution of a new system involves three major stages--planning, development, and implementation--each of which must be managed properly. In the case of the Regulatory Information System, management deficiencies existed in all three stages:

--Planning. The Federal Power Commission did not clearly define user needs or perform an adequate cost-benefit analysis of the system. (See p. 18.)

--Development. The Federal Power Commission did not (a) finalize reporting forms to be used by industry, (b) ensure the workability of the computer software, nor (c) define the format in which the reported data would be used. (See p. 19.)

--Implementation. (a) Attempting to use the system prematurely, the Commission loaded large amounts of data into computerized files which were later found to be largely unusable, and (b) the Energy Information Administration tried unsuccessfully to use the system for other data processing needs, despite the lack of demonstrated success. (See p. 25.)

To make matters worse, neither the Federal Power Commission nor the Energy Information Administration effectively monitored cost and progress during any of the three stages. (See p. 27.)

The management deficiencies were further intensified by such disruptive influences as

--poor communication among system developers and intended users at the Federal and State levels,

--lack of continuous involvement and support from top Federal management, and

--disruptions in both organization and personnel.

WHO WAS RESPONSIBLE?

Because management weaknesses had negatively affected progress on the system while it was managed by the Federal Power Commission, the Energy

Information Administration in 1977 inherited a system already fraught with problems. It was therefore presented with a difficult management challenge. On the other hand, it already knew, through earlier reviews by the Commission on Federal Paperwork, by GAO, and by others, what many of the system's problems were. The Federal Energy Regulatory Commission, the system's intended primary user, also had this knowledge.

The Energy Information Administration, therefore, should have been in a position to work aggressively on necessary solutions. It did not do so, however, and by 1979, the combination of technical problems and loss of confidence by various parties probably dictated that only one move was realistic: to cease development of the system.

The Federal Power Commission was responsible for development work on the Regulatory Information System through October 1977. The Energy Information Administration cannot be held accountable for the many management deficiencies before that date, which undoubtedly contributed greatly to the system's ultimate demise. Yet that agency managed the system's development for 2 years and is currently managing the development of other major energy information systems for the Federal Energy Regulatory Commission and for others. It therefore seems appropriate that the Energy Information Administration consider the full Regulatory Information System experience to help guard against the recurrence of similar situations.

CAN IT HAPPEN AGAIN?

Having reviewed the lengthy and costly effort to develop the Regulatory Information System, its ultimate collapse, and some of the reasons for its failure, one might ask: Can it happen again? The Department of Energy thinks not, but GAO believes it would be useful for the Energy Information Administration to review its management of system development efforts. In the opinion of Energy Information Administration officials, there is little likelihood that problems of the magnitude experienced in the ill-fated attempt to develop the Regulatory Information System will recur. The officials emphasized that the most serious management weaknesses in the experience occurred in the earlier stages of development,

under the Federal Power Commission. They contend that Energy Information Administration management practices are far better--particularly in the critical early stages of system development--than were the Commission's.

GAO is aware that the Energy Information Administration has a different approach to the management of system development than the Federal Power Commission and does not take a pessimistic view that all the problems associated with the Regulatory Information System can recur. Yet some factors indicate that the Energy Information Administration might profit from an indepth review of how it manages the development of energy information systems. Consider, for example, that:

--Recent reviews of two other systems being developed by the Energy Information Administration identified problems similar to those that occurred in the attempted Regulatory Information System development.

--Weak contract administration practices, which affected the major Regulatory Information System contract, were recently found by GAO to be prevalent within the Department of Energy.

--Many other problems noted in this report were recently found by GAO to be common when the Federal Government contracts to develop computer software, as it did for the Regulatory Information System.

GAO believes that these factors, coupled with the costly and largely unsuccessful outcome of the experience summarized in this report, should serve as a spur to the Energy Information Administration to reevalute its system management procedures. (See pp. 39-41.)

INTERESTED PARTIES SHOULD BE NOTIFIED

In addition, GAO believes the parties that were counting on receiving the promised benefits of the Regulatory Information System should be notified of its current status. Those who were advised of the system's goals and initial development in the early 1970s, and who were led to believe it was progressing smoothly as late as 1979, have long awaited the promised results.

At the time of this review, the Energy Information Administration had not formally advised the State regulatory commissions and the regulated industries that the Regulatory Information System was being discontinued.

RECOMMENDATIONS

The Secretary of Energy needs to take action to ensure that the management weaknesses leading to the long, costly, and unsuccessful attempt to develop the Regulatory Information System are not repeated. The Secretary should have the Administrator, Energy Information Administration:

--Formally document and communicate to the interested public plans for the future use, if any, of the Regulatory Information System concept and the computer software developed, giving reasons for the actions to be taken.

--Establish procedures for reviewing the development of current and future energy information systems. The review procedures should stress the importance of assuring that (1) user requirements are adequately identified, (2) appropriate cost-benefit analyses are performed, (3) plans are prepared for each stage of the system development work, and (4) the work of system developers and the needs of system users are coordinated throughout the development effort.

AGENCY COMMENTS

The Acting Chairman, Federal Energy Regulatory Commission offered no substantive comments on this report but agreed to cooperate with any program to implement GAO's recommendations. (See app. III.) On the other hand, the Department of Energy strongly disagreed with GAO's conclusions and recommendations. (See app. IV.)

The Department of Energy considered GAO's first recommendation a "moot point" since it said the Energy Information Administration has no plans for the future use of the Regulatory Information System. Nevertheless, GAO believes that the Energy Information Administration should formally notify State regulatory commissions, regulated industries, and others of the status of the Regulatory Information System so they can consider this fact where it affects their own operations.

The Department of Energy also rejected GAO's second recommendation, stating that the Energy Information Administration has a clear and comprehensive set of standards and operating procedures to which every system development effort must conform. The Department referred to several formal reviews to provide management oversight throughout the life cycle of system development. GAO recognizes that the Energy Information Administration's formal reviews have management value, but believes they do not fully address all areas of concern which arose in the case of the Regulatory Information System and two other major systems. In view of the Energy Information Administration's important role in energy information and the large amount of Federal funds involved, GAO believes its recommendations should be implemented. Toward this end, GAO is providing the Energy Information Administration copies of an earlier GAO publication which identified necessary prerequisites to successful development and implementation of computer-based management information systems.

ABBREVIATIONS

DOE	Department of Energy
EIA	Energy Information Administration
FERC	Federal Energy Regulatory Commission
GAO	General Accounting Office
OMB	Office of Management and Budget
RIS	Regulatory Information System

Contents

CHAPTER 1

INTRODUCTION

The importance of energy and of an appropriate national energy policy needs no introduction. Concerned representatives from all levels of Government, all sectors of the economy, and the general public wrestle with the difficult question of what can be done to improve the Nation's energy posture. Federal energy policies depend on the ready availability of current, accurate, and relevant information.

This is the story of one costly and lengthy effort to develop a major energy information system. The effort failed. We will discuss why it failed and how the problems that led to its demise can be avoided in future system development efforts.

ENERGY REGULATION INVOLVES USE OF INFORMATION

The Federal Power Commission was created on June 10, 1920, by an Act of Congress--the Federal Water Power Act. Originally charged with navigation improvement and water power development, the Commission later was given the responsibility for regulating the interstate activities of the electric power and gas industries. On September 30, 1977, the Federal Power Commission passed into history.

On October 1, 1977, the Federal Energy Regulatory Commission (FERC) was created by the Department of Energy Organization Act. The new Commission is an independent agency within the Department of Energy (DOE). It has assumed many of the functions of the Federal Power Commission, such as setting rates and charges for transmitting and selling natural gas and electricity, and granting licenses for hydroelectric power projects. In addition, FERC has been assigned the Interstate Commerce Commission's former authority to establish rates for transporting oil by pipeline, as well as to set the value of such pipelines. In October 1978, the Congress passed five separate laws, referred to collectively as "The National Energy Act." This legislation further broadened FERC's scope. Among its new responsibilities is the regulation of producer sales of natural gas in intrastate commerce.

Although the regulatory functions of the Federal Power Commission were passed on to FERC, the responsibility for collecting, processing, and publishing data on energy reserves, the financial status of energy-producing companies, energy production, energy demand and consumption, and other areas, was passed on to another new agency within DOE--the Energy Information Administration (EIA). Also created by the Department of Energy Organization Act, EIA provides data collection, processing, publication, and distribution services of energy information to all of DOE. Many of the staff and the systems previously used for these purposes were also transferred to EIA.

Many energy-related companies subject to Federal regulation are also subject to regulation by one or more States and/or the District of Columbia. In collecting information from companies, most State regulators use some forms that are essentially the same as those used by Federal regulators.

THE REGULATORY INFORMATION SYSTEM: A BRIEF HISTORY AND DESCRIPTION

Although the general idea can be traced to earlier times, the concept of the Regulatory Information System was not formally presented until April 1972. 1/ In that month, the Federal Power Commission proposed developing a system to consolidate and automate much of the data collected from regulated gas and electric companies. Receiving generally favorable comments from representatives of regulated industries on the need for such a system, the Commission issued an order in September 1973, calling for the development of a "fully automated computer regulatory information system."

The decision to develop the system was based on the premise that the Commission was overburdened and its workload and backlog would continue to increase. The use of automatic data processing was intended to relieve the pressure already existing as well as that anticipated. The Commission's September 1973 order identified the following system goals:

--Standardize information collection.

--Eliminate duplicative information collection.

--Provide faster access to information.

--Accommodate new regulatory techniques.

At that time, the need for such a system seemed to be well grounded, and the system goals seemed laudable.

The Regulatory Information System was intended to collect, process, and provide financial and operating information reported to the Federal Power Commission by hundreds of companies--principally natural gas producers, natural gas pipelines, and electric utilities. It was also to process and provide information on the Commission's internal administrative activities and its interactions with regulated industries.

1/This system has been referred to at times as the Respondent Information System; for purposes of consistency, it is referred to throughout this report by its original designation.

The system concept envisioned use by State regulatory commissions to avoid the possibility of States' imposing duplicate reporting requirements on regulated industries.

Complex and ambitious system envisioned

The planned system was to employ a sophisticated "data base" approach, which would enable sharing a common set of computerized files. Also, a large effort to revise industry reporting forms was envisioned.

In a data base environment, an automated pool of data can be accessed, manipulated, and retrieved by a community of users--in this case, Federal and State regulators and others. Implementing a large data base system can be a complex task.

The conceptual design of the Regulatory Information System involved

- --the use of a "data base management system"--computer software commercially purchased;
- --the development by a contractor of other computer software, specifically tailored to work with the commercially purchased software; and
- --the development and use of a "data element dictionary," which would work with the computer software to make the Regulatory Information System operate.

The second two features were considered pioneering concepts at the time and were intended to provide a system that would be easy to use. However, because of its planned large size and technical features, development of the system became a highly complex task--even more so than some other data base systems.

To make the system work, the reporting forms used by the Federal Power Commission to collect information from regulated companies would have to be revised. Standard formats and consistent units of measurement--not found on the old forms--were considered necessary for this particular data base concept. Because the reporting forms included thousands of individual data elements, revising the reporting formats also became a complex and time-consuming task.

Contractors were heavily involved

From the initial stages, the Federal Power Commission relied heavily on contractors--principally one--to develop the planned system. In June 1971, the Commission awarded a contract to an international computer company for a computer feasibility study. The contractor recommended the system that became known as the Regulatory Information System.

In June 1973, the Commission awarded a 1-year contract to perform initial system development work. In June 1974, the same firm was awarded a follow-on contract to continue system development and to operate the computer facility that was acquired specifically for this effort. The contract contained options which allowed for periodic renewal of services from the contractor over a 5-year period. The contractor was retained through December 1979 for this effort, a period of 5-1/2 years.

Responsibility for the system was transferred

When the Department of Energy was established in October 1977, primary responsibility for developing the system shifted to the newly formed Energy Information Administration--the Department of Energy's information gathering and processing arm. However, the Federal Energy Regulatory Commission continued to be involved because it was to be the primary user of the new system.

The Energy Information Administration invested further time and money in developing the Regulatory Information System. Developmental work proceeded and funds continued to be expended under Federal contracts, within Federal offices, and, to a lesser extent, by those outside the Federal structure. Developmental work was stopped in September 1979.

EARLIER REVIEWS OF THE REGULATORY INFORMATION SYSTEM

Both GAO and the Commission on Federal Paperwork previously reviewed certain aspects of the development of the Regulatory Information System, and both issued critical reports.

In our earlier report, we criticized the Federal Power Commission's June 1974 contract award. 1/ Although we concluded that the award was in technical conformance with Federal procurement regulations on competition, we also concluded that several Commission actions detracted from the competitiveness of the award.

In 1976, the Commission on Federal Paperwork reviewed and criticized the potential reporting requirements of the Regulatory Information System. The Commission became interested in this system because (1) industry representatives had expressed a fear that--instead of reducing reporting burdens--the new system might actually increase them and (2) system proponents claimed that the system might serve as a model to other Federal agencies to reduce reporting burdens. The Commission criticized planned reporting

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1/"Contract Award by the Federal Power Commission for Developing and Installing a Regulatory Information System" (RED-76-59, Apr. 2, 1976).

requirements as potentially overburdening to industry, and questioned whether the system would produce valid data. It therefore passed a resolution requesting that the Federal Power Commission defer implementation of the system until the industry reporting burden could be minimized.

We later made a limited followup review to determine whether the Federal Power Commission was taking the corrective steps it had promised. In September 1977, we issued a report to the Chairman, Commission on Federal Paperwork, stating that although much remained to be done, the Federal Power Commission had begun to take corrective steps. 1/

OBJECTIVES, SCOPE, AND METHODOLOGY

The review by the Commission on Federal Paperwork and our limited followup review were geared toward reviewing the planned reporting requirements of the Regulatory Information System. After those reviews, the impression was given that better development progress would be forthcoming. However, in 1979, the expected progress in development clearly was not forthcoming. Representatives of State regulatory commissions, the regulated industries, and others expressed concern and confusion over what had happened to this highly touted system. Many years had elapsed, millions of dollars had been expended, and observable results were minuscule.

We therefore decided to do a more comprehensive review of the status of the Regulatory Information System. The objectives of our review were to assess the results achieved from the system development effort, to study why delays and problems continued to be encountered, and to consider whether further corrective actions by Federal managers might still be needed.

We made our review primarily at the Washington, D.C., offices of the Federal Energy Regulatory Commission, the Energy Information Administration, and other Department of Energy offices, as appropriate. We reviewed budget submissions, contract files, reports, records, and correspondence relating to the progress and problems in developing the Regulatory Information System. In order to understand and evaluate various perceptions of the system, we also interviewed many Federal officials and technical staff who were involved with the lengthy effort to develop the Regulatory Information System. In addition, we held discussions with representatives of Federal contractors and regulated industries, and through a questionnaire solicited the views of State regulatory commissions. (See app. II.)

1/Letter report to the Chairman, Commission on Federal Paperwork (GGD-77-95, Sept. 30, 1977).

The history of the system development effort extended over many years. During that time changes were made in assignments of responsibility and certain disruptions occurred due to major organizational changes. These events made it difficult to ensure that we had located and interviewed all officials who had been responsible for this effort, and identified and reviewed all pertinent files.

Although these factors complicated our analysis, the scope of our work was sufficient to permit us to reach definitive overall conclusions about what major problems had been encountered and to make recommendations about what should be done to avoid similar problems in the future.

CHAPTER 2

MUCH WAS PROMISED BUT LITTLE ACHIEVED

DESPITE A LONG, COSTLY EFFORT

Over the years, the Congress, State regulatory commissions, regulated energy industries, and others were repeatedly told of the benefits to be obtained when the Regulatory Information System became operational. System proponents claimed that it would

--save Federal regulators and regulated industries millions of dollars,

--save State regulators time as well as money, and

--become a model for other Federal agencies.

When system development was finally halted, after an investment of millions of dollars over nearly a decade, none of the above benefits had been achieved and none were likely in the future. Further, interested parties were not apprised of the problems being encountered. In contrast, over earlier years, system proponents had continued to promise an imminently operational system and continued to make misleading statements, giving the false impression that system development was progressing well and system objectives were being met.

The results achieved from the Regulatory Information System fell far short of what was originally planned. Only a few minor computerized applications, developed as part of the effort, ever became operational and most of those had been--or were scheduled to be--replaced with other approaches in 1980. Initial operation of the system was planned for 1975. Its Federal sponsors termed it "operational" in September 1979, but it never really worked as intended.

Despite repeated delays and problems in the system's development, the Federal Power Commission continued to assure the Congress and others through 1977 that the effort was progressing well. After the Energy Information Administration assumed primary responsibility for the system's development, its completion was delayed even further. But still, the system's proponents continued to report to various groups as late as 1979 that development was progressing well. Thereafter, those to be affected by the system and those who had hoped to benefit from it were left "in the dark," receiving no formal status reports on the system.

The first public indication that serious problems were being experienced came in April 1980, when the Energy Information Administration publicly announced cancellation of an ongoing effort to revise the reporting forms related to the system.

MUCH WAS PLANNED BUT LITTLE ACHIEVED

The Regulatory Information System was to involve all regulatory and administrative information used by the Federal Power Commission in its daily activities. The system was to improve the effectiveness of the Commission's decisionmaking, decrease cost and time required to make decisions, decrease the reporting burden to industry, and assist both State and Federal regulators. However, it never became operational as planned, it produced very little, and even the few uses made of it have been or are scheduled to be replaced with other approaches.

What was planned?

The system's major feature was to be a centralized automated data bank for all regulatory and internal administrative data and for legal information concerning cases and other matters pending before the Commission. The data bank was originally planned to have six major data files. Two additional minor files containing one-time energy information were later considered. Computer programs would be used to process the data which would then provide day-to-day support to Federal and State energy regulatory staff, promote effective control of both internal Commission administrative matters and issues pending before the Commission, and produce energy-related reports for use by the Congress, Commission staff, State regulators, and other interested parties.

The effort was to be accomplished in two phases--the first to include regulatory data collected from industry on public use forms, and the second to involve internal administrative data and legal data concerning cases pending before the Commission, such as applications, petitions, and other matters. A major effort of the first phase was to be the revision of all forms the Commission was using to collect data from regulated energy industries.

After system development responsibility was transferred to the Energy Information Administration in October 1977, that agency attempted to use portions of the system software for uses other than those originally intended. These attempts were made despite the fact that efforts to use the system up to that time had yielded poor results.

What was accomplished?

Although this effort lasted almost a decade and millions of dollars were spent, very little was ever achieved. The second phase, the administrative data and legal information files, never materialized. Attempts by Commission staff to use the system to support daily activities were mostly unsuccessful because much of the data in the computer was either incomplete, inaccurate, or not readily accessible. State regulatory commissions and others never gained access to the system as originally planned.

Of the planned six major files, only two were used to publish energy reports--and only one complete publication and portions of two others were ever produced from those two files. This fell far short of the original concept, which saw the computer generating a multitude of reports at regular intervals and others as needed from day to day.

The results of attempting to redesign the forms used in collecting data from regulated energy companies were also meager. At one time during the effort, 30 revised system-related forms were envisioned. When the decision was made in June 1979 to discontinue this effort, only one form had been finalized and used.

Results of the additional attempts by the Energy Information Administration to use the system for other than the originally planned regulatory and internal administrative functions were equally discouraging. (See p. 26.)

Figures 1 and 2 on pages 10 and 11 illustrate the Regulatory Information System's planned and actual data loading and use. Appendix I provides further details on products generated by the system and results of subsequent attempts by the Energy Information Administration to use the system for other than originally planned uses.

LACKING SYSTEM PROGRESS, PLANNED USERS RETAINED EXISTING APPROACHES

The Regulatory Information System development effort failed to provide the promised readily available automated data bank. Because the planned primary users of the system, Federal regulators, could never depend on the system, they continued to rely on available alternatives. Usually, this meant continuing the same general approaches followed before work was ever begun on the Regulatory Information System, such as

--hardcopy reports submitted by industries,

--reports produced from more traditional individual files and computer programs, or

--purchased automated energy information.

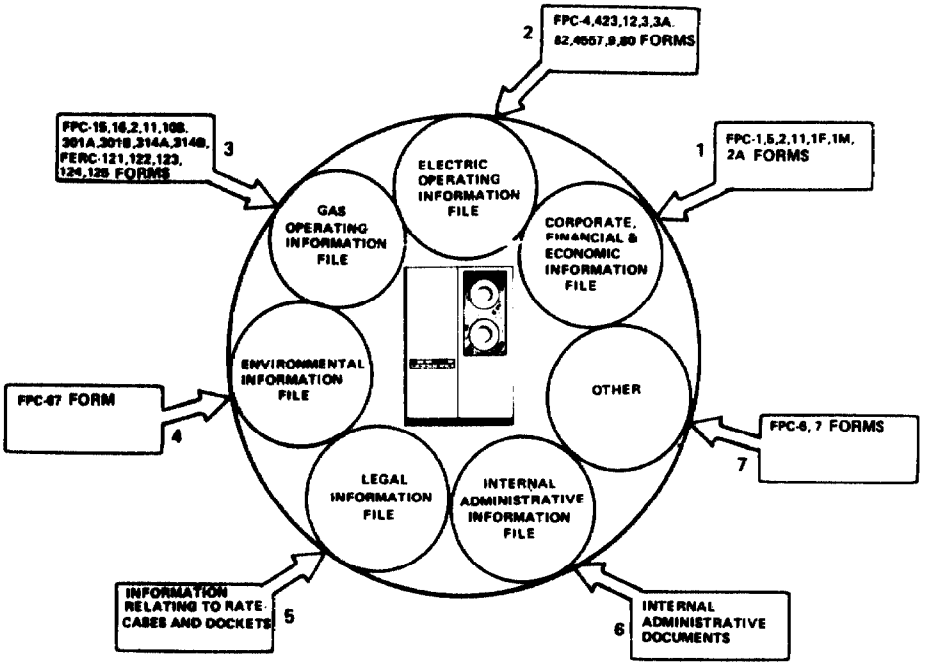
SYSTEM WAS TERMED OPERATIONAL ALTHOUGH IT ESSENTIALLY COLLAPSED

In contrast to the benefits envisioned and so often expounded by advocates of the system, and in contrast to the appearance given that all was progressing well, the effort essentially collapsed in 1979.

In September of that year, the Energy Information Administration issued an internal memorandum characterizing the Regulatory

Figure 1.
REGULATORY INFORMATION SYSTEM
DATA LOADING INTO INTEGRATED
DATA BASE

PLANNED



ACTUAL

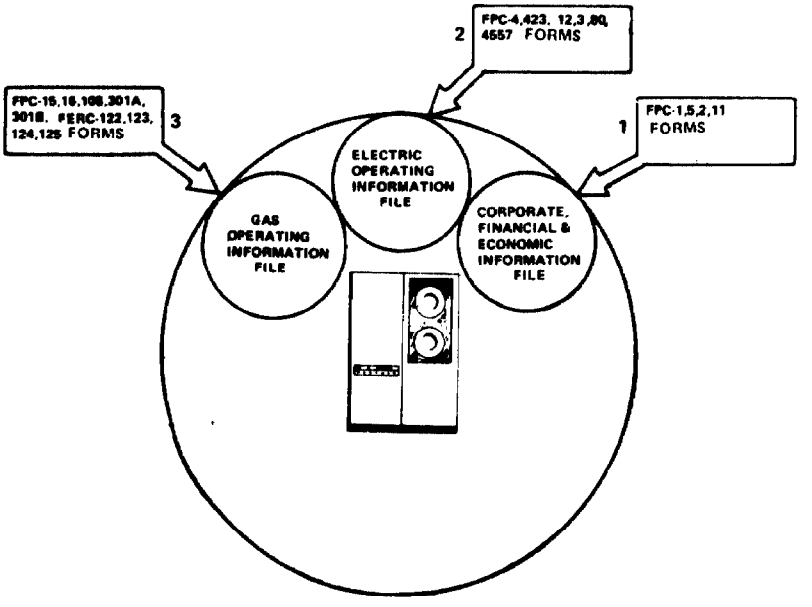
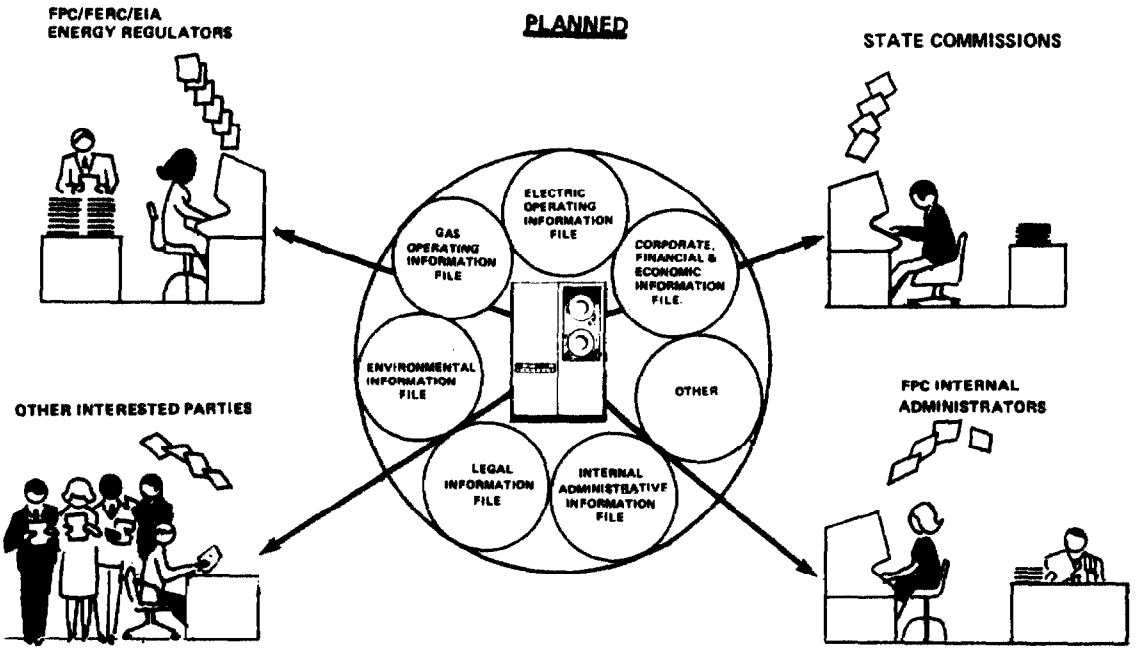
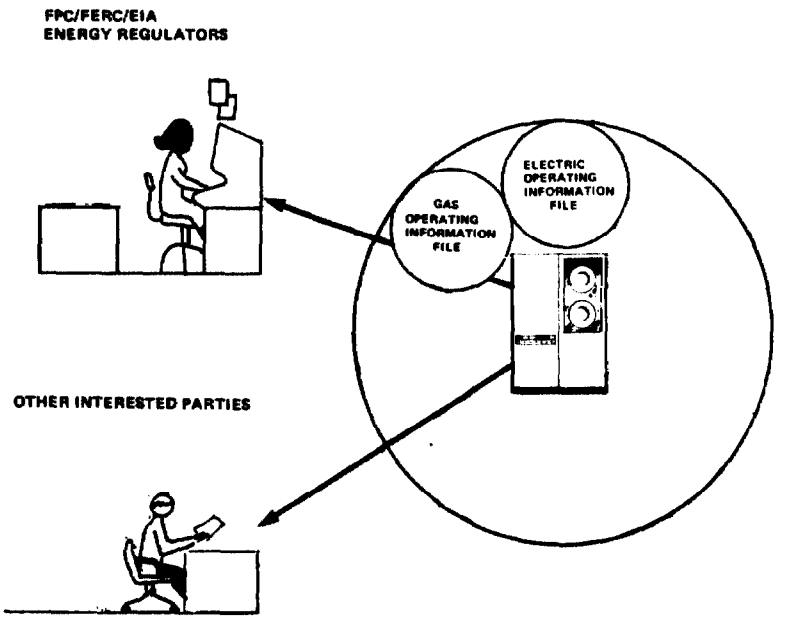


Figure 2.
REGULATORY INFORMATION SYSTEM DATA USAGE FROM INTEGRATED DATA BASE





Information System as "operational," and stating that further system development work would not be performed. As indicated earlier, despite that characterization few useful publications had been produced using computer programs developed as part of the system. Moreover, by 1980 the Energy Information Administration had either quit using those computer programs or was planning to do so--for those few publications or for any other purpose.

In addition to the problems encountered in using the computer programs, the Federal sponsors of the Regulatory Information System also had problems finalizing the system-related reporting forms to be used for collecting energy regulatory data. Only one revised form was issued and used. Data from the form was loaded into the system's automated files but testing of the data showed it to be inaccurate and therefore it was never productively used.

Reduced reporting requirements caused FERC to lose interest in supporting the system

The final blow to revising the remaining forms, and eventually to the system itself, came when the Federal Energy Regulatory Commission determined in 1979 that the data it was collecting from energy companies should be reviewed to determine if the data were essential for regulation. Under these circumstances, FERC decided that further investment on its part in developing the Regulatory Information System was unwarranted.

Over the years, Federal regulators, the industry, and others could not agree on the system-related reporting forms. The Federal Power Commission had officially proposed revised forms in 1976. Some modifications to the forms were made after 1976, primarily in response to criticisms from the Federal Paperwork Commission and others after the forms had been publicly proposed. Yet final agreement on the forms had still not been reached by 1978. At that time, FERC began validating the need for data reported by the industries. Initial results of this validation showed that a great deal of the information planned to be part of the Regulatory Information System was not needed.

The results of the validation effort would have necessitated another revision of the proposed new forms and of the system's data files and software, which had also been modified in the past. Instead of making even more revisions, FERC decided in June 1979 to abandon the proposed system-related forms. It further rejected the "wholesale" approach to automating data which was envisioned under the Regulatory Information System. Instead, FERC elected to determine the need for data automation on a case-by-case basis, thus essentially returning to the approach taken before the Regulatory Information System effort began.

Public notices on forms were canceled

As a result of its effort to validate its need for data, FERC had stopped or planned to stop much of its data collection. In April 1980, the public notices that had been issued during 1976 by the Federal Power Commission, proposing revised forms to accommodate the Regulatory Information System, were canceled.

Except for this public cancellation, interested parties--such as State regulatory commissions and the affected industries--were not formally apprised of the problems being encountered or the possibility that the Regulatory Information System might not become operational. For the most part, they and others were left to speculate about what had happened to this highly acclaimed system.

THE CONGRESS AND OTHERS WERE MISLED ON SYSTEM'S PROGRESS

Federal advocates of the Regulatory Information System advised the Congress and others that the system would be operational in 1975. Delays and problems were encountered again and again, and yet, as multiple delays occurred, the system's sponsors--in seeking funding for the system and in other documents--continued to assure the Congress, the regulated industries, and others that good progress was being made and that the system's operation was imminent. Similar statements, apparently made to give the appearance that system development was progressing well and envisioned goals were being met, were clearly misleading. It was not until September 1979 that Federal offices informally termed the system operational--and even then it had never worked as planned.

Some questionable statements were made to the Congress and others that the system was progressing well

In budget requests for 4 successive years beginning with fiscal 1975, the Federal Power Commission stated that the Regulatory Information System would become operational in that budget year. The system did not become operational in any of those years.

In its fiscal 1975 budget request, the Federal Power Commission advised the Congress and the Office of Management and Budget (OMB) that the system would become operational and be in use throughout the Commission in 1975. The system did not become operational in fiscal 1975. In its fiscal 1976 budget request the Commission again said that the system would become operational in the year for which money was being requested--1976. Although that would have been a year later than previously promised, the Commission said that the system's development was proceeding on schedule.

Despite the promises made during the preceeding 2 years, the Commission again advised the Congress, in its budget request for

fiscal 1977, that the system would become operational during that year. And then in fiscal 1978--for the fourth consecutive year--the Commission's budget request stated that fiscal 1978 would be the first year of independent operation of the system's first phase--encompassing the data collected from regulated industries.

In addition to its repeated promises to the Congress and OMB of an imminently operational system, the Commission made similar overly optimistic assessments of the system's progress in its 1975 annual report. Although the development of the Regulatory Information System never progressed even through its first phase, the Federal Power Commission reported that "the first phase of RIS was almost completed at the year end * * * the development of additional phases of the system are already underway."

The planned system was to include six major automated data files. In its fiscal 1977 budget request, the Commission told the Congress and OMB that all six major data files had been developed, that data was being loaded into six files, and that the six files were being accessed during the Commission's daily operations. At that time, the Commission also advised OMB that the Regulatory Information System had become an integral part of day-to-day operations in virtually all areas of the Commission.

These statements about the system's status were clearly false since, when development of the system was halted in September 1979, data had been loaded into only three of the files and a few reports had been produced from only two. Obviously, the system could not have been an integral part of day-to-day operations in virtually all areas of the Commission, as earlier stated.

Energy Information Administration continued to leave impression of progress

The Energy Information Administration, after assuming primary responsibility for the system in October 1977, had little to say officially about its progress. But informal statements were inaccurate.

In February 1979, the system's project manager advised industry representatives that "EIA, after evaluation, mounted an intensive management effort together with FERC to guide RIS through a thorough evaluation to operational completion by early 1980." In an April 1979 response to an inquiry on the status of the Regulatory Information System, the project manager wrote to a State regulatory commission official that the system had become an integral, viable part of the Department of Energy's data processing capabilities. In September 1979, another EIA representative informally advised several representatives of State regulatory commissions that the system was functioning well in a changing environment.

MILLIONS OF DOLLARS WERE INVESTED TRYING TO DEVELOP THE SYSTEM

It was not possible to identify all the costs associated with the effort to develop the Regulatory Information System because responsible Federal offices did not separately account for all such costs. However, we identified over $26.5 million in costs--some actual, some estimates--as shown in the chart on page 16.

This cost information is not precise. For example, we include the entire cost of operating the computer facility because it was acquired specifically to support development of the Regulatory Information System and was used predominantly for that purpose. While responsible officials pointed out that the facility was also used for other purposes, records were not available to substantiate any other significant uses.

On the other hand, additional costs were incurred for which we had no basis to estimate and therefore did not include. Examples are

--training costs for Federal personnel relating to the system,

--some overhead items in Federal offices such as space required for large numbers of contractor personnel, and

--Federal personnel costs relating to the design and revision of reporting forms.

Although the cost information we developed is not precise, the investment in this system was clearly substantial. As discussed later in this report, we believe separate cost information should be maintained for systems of this size and complexity.

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The record of attempted development and implementation of the Regulatory Information System can be summed up in four lines:

--The anticipated benefits were impressive.

--The final results were minuscule.

--The Congress and others were not accurately advised of progress.

--The costs were high.

Costs Associated With The Regulatory Information System

By Federal offices:			
Contract, awarded June 1971, for computer feasibility study		$ 24,000	
Contract, awarded June 1973, for initial development and implementation of the system		858,000	
Major contract, awarded June 1974 and active through December 1979, for (a) system development and (b) operation of the computer facility		14,161,000	
Our estimate of expenditures by the Federal Power Commission, for in-house support and other contractual assistance		8,287,000	
Our estimate of expenditures by the Energy Information Administration for in-house support ($664,600) and other contractual assistance ($564,400)		1,229,000	
Total Federal offices			$24,559,000
By regulated industries: (note a)			
Estimated expenditures, as provided by an association representing electrical industries	between and	1,000,000 2,000,000	
Estimated expenditures, as provided by an association representing gas industries		960,000	
Total regulated industries	between and		1,960,000 2,960,000
By State regulatory commissions:			
Some costs were incurred, but no basis for estimate			-
Total costs identified	between and		$26,519,000 $27,519,000

a/Regulated industries did not directly participate in the system development, but did incur costs in areas such as commenting on proposed rulemakings and testing proposed reporting forms.

CHAPTER 3

INEFFECTIVE MANAGEMENT CAUSED THE REGULATORY INFORMATION SYSTEM TO FAIL

More effective Federal management clearly could have avoided many factors that helped cause the Regulatory Information System to fail--although others perhaps were beyond management's control. Weaknesses in the management approach began during the years the Federal Power Commission had system development responsibility and remained largely uncorrected after that responsibility was transferred to the Energy Information Administration. Corrective action was not taken even though major problems were identified earlier by the Commission on Federal Paperwork and by us.

Overall management of the Regulatory Information System was poor throughout the entire process and was the major factor contributing to the failure of the system. There were specific weaknesses in all three stages--planning, development, and implementation--of system evolution. During planning, user needs were not clearly identified and cost-benefit analyses were not adequately performed. During development, the question of industry reporting forms was unresolved, the usability of computer software was not ensured, and the format in which the data was to be used was not determined. In attempting implementation, the Federal Power Commission prematurely started loading information into computerized files still under development, and the Energy Information Administration tried less than successfully to use the system's software to satisfy other data needs.

Although management deficiencies existed in all three major stages, decisions were made to proceed from one stage to another before ensuring that the first one had been completed. As a result, work on all three stages was ongoing simultaneously. The lack of adequate management was compounded because system progress and costs were not effectively monitored. In addition, corrective action was not taken even when specific problems were identified by the Commission on Federal Paperwork, by us, and by others.

Management deficiencies were further intensified by other disruptive influences, including

- --poor communication among system developers and intended users at the Federal and State levels,
- --lack of continuous involvement and support from top Federal management, and
- --disruptions in both organization and personnel.

WEAKNESSES IN SYSTEM PLANNING

Planning a new system requires identifying the information needs of the system's users, and should also involve a continuous cost-benefit analysis of the need for the system. Planning for the Regulatory Information System did not fully address these two needs.

User needs were not clearly identified

The starting point in developing any new system--particularly one as large, complex, and costly as the Regulatory Information System--should be to identify the requirements of the system's ultimate users. Without this initial step, high costs can be incurred without achieving the system's intended objectives. User requirements were not fully determined before development of the Regulatory Information System was begun, and a general effort to identify and validate user needs did not begin until 1978.

As a result of a recommendation by the Commission on Federal Paperwork, the Federal Power Commission in 1976 dropped plans to place new reporting requirements on the regulated industry. This was done because

--the new reporting requirements would have been very costly to industry and

--the regulatory need for the new requirements had not been determined.

Not until 1978 was there a general effort to validate the need for all energy information being reported by industry and planned for inclusion in the Regulatory Information System. The 1978 validation effort was not initiated as part of the project, but was begun when FERC voluntarily agreed to go along with an Executive order directing executive agencies to minimize regulatory burden.

The initial results of the validation, still ongoing at the time of our review, identified much information and many types of information the Federal Energy Regulatory Commission does not need. Thus, further revisions to the system's reporting forms, which had already been under development and revision for several years, became necessary. This was a major factor in again delaying, and finally stopping, further system development.

Adequate cost-benefit analysis was not performed

The costs and benefits of the system continued to be discussed in only very general terms as system work proceeded.

Weighing the costs and benefits of any new system can be a challenging task. Because the Regulatory Information System concept involved costs and benefits to many parties--the Federal Government, State governments, the regulated industries, and ultimately the consumers--a cost-benefit analysis would be particularly challenging. Yet, because of the very large costs involved and the range of benefits sought, a cost-benefit analysis should have been performed at the inception of the system development and updated as necessary when circumstances changed.

According to an EIA consultant, a real need still existed in 1978 to perform an exhaustive cost-benefit analysis of the Regulatory Information System. The consultant noted that FERC was functioning without the system and could continue to do so for the next few years. However, an analysis of future needs might show that failure to develop the system when lead time was available could result in catastrophic problems at a later date.

WEAKNESSES IN SYSTEM DEVELOPMENT

The development stage of the Regulatory Information System was begun although the critical planning functions previously described had not been performed. The probability that unnecessary costs would be incurred and/or that the system would not meet information needs was thereby increased. Moreover, the development stage was initiated and continued even though

--the industry reporting forms remained unsettled,

--the usability of the software was questionable, and

--the formats in which the data was to be used by regulators remained mostly undecided.

Together, these factors worked strongly against successful system development.

Industry reporting requirements remained unsettled

From the beginning of system development, it was difficult to arrive at acceptable and appropriate reporting requirements for industry. In fact, the reporting forms were still not completely decided when FERC withdrew its support for the system in 1979.

The reporting forms, which had been used by industry for many years and were well understood, were to be replaced by revised forms to accommodate the planned new computerized system. As discussed earlier, the forms originally proposed--which were designed mainly as computer input documents--were criticized for their complexity in the 1976 review by the Federal Paperwork Commission. In response, the Federal Power Commission revised the proposed forms and conducted a pilot test with selected companies.

The pilot test identified other problems with the forms and further revisions were considered necessary. As discussed on page 13, the subsequent FERC effort to validate Federal information needs also substantially influenced the design of the forms.

Instead of continuing to make further revisions, FERC decided in June 1979 to discontinue the effort to revise the reporting forms to accommodate the Regulatory Information System. This fact, however, was not publicly announced until April 1980. By that time, FERC had eliminated many forms and/or data requirements that were previously planned for incorporation into the Regulatory Information System. The revised reporting forms issued by the Commission in response to the data validation effort were very similar to the forms used before the effort to develop the Regulatory Information System had begun.

On the following pages are illustrations of the Federal Power Commission forms proposed for replacement (fig. 3), forms proposed for the system (fig. 4), and the new forms issued after the decision had been made not to continue the system-related forms development (fig. 5).

Computer software use was questionable

Whether the computer software developed for the Regulatory Information System could be effectively used was questionable because:

--The repeated changes to the proposed reporting forms triggered changes in the software.

--The software was not adequately documented.

--The software was considered overly complex and hard to use.

--The number of technicians assigned to the project who had gained familiarity with the software was allowed to dwindle.

Nevertheless, some system developers contended that the software was fully usable and that the real obstacle to system success was the inability to settle on industry reporting forms.

The computer software developed for this system is dependent on the data and the formats used to report the data. Since the definition of the data and the proposed reporting formats were repeatedly changed, the software had to be changed accordingly. Because a final agreement on reporting forms was never achieved, software development was difficult to complete.

To operate computer programs, technicians need documentation to understand how the programs operate and to help them solve problems as they are encountered. The contractor that developed

Figure 3.
EXAMPLE OF OLD FORM (EXTRACT) PROPOSED FOR REPLACEMENT BY RIS FORM

FEDERAL POWER COMMISSION
FPC Form No. 11

NATURAL GAS PIPELINE COMPANY
MONTHLY STATEMENT

REFERENCE DATA
COMPANY CODE NO.
FOR MONTH OF 19___

Form Approved
Budget Bureau No. 54R056
Page 1 of 5

INSTRUCTIONS - Complete and return two copies to the Federal Power Commission within 40 days after the end of the reported month. Retain one copy for your files. Include brief description of any adjustments significantly affecting the monthly statement. Estimates subject to later revision are permissible. Year ago estimates now revised should be identified by a double asterisk (**).

RETURN TO ➧ FEDERAL POWER COMMISSION
WASHINGTON, D. C. 20426

ATTN: OFFICE OF ACCOUNTING AND FINANCE

FROM *(Name of Company)*

ADDRESS *(Number, Street, City, State and Zip Code)*

SIGNATURE *(Chief Accounting Officer)*

DATE PREPARED *(Enter numerically, month, day and year)* / /

TABLE I — CONDENSED STATEMENT OF INCOME

ITEM (a) *(Indicate contra items by a minus sign preceding the amount.)*	CURRENT YEAR *(Omit cents)* (b)	PREVIOUS YEAR *(Omit cents)* (c)
	24 — 33	34 — 43
Utility Operating Income:	$	$
1. Gas Operating Revenues (400)		
Gas Operating Expenses:		
2. Operation and maintenance (401, 402)		
3. Depreciation, depletion, and amortization (403 - 407)		
4. Taxes other than income taxes (408.1)		
5. Income taxes - Federal (409.1)		
6. Income taxes - Other (409.1)		
7. Provision for deferred income taxes (410.1)		
8. Income taxes deferred in prior years - Credit (411.1)		
9. Investment tax credit adjustments (Net) (411.4)		
10. Total taxes		
11. Total operating expenses		
12. Net gas operating revenues		
13. Income from gas plant leased to others (412, 413, 408.1, 409.1)		
14. Gas utility operating income		
15. Other utility operating income (414, 408.1, 409.1)		
16. Disposition of utility plant (411.6, 411.7)		
17. Total utility operating income		
18. Other income and deductions - Net- (except Allowance for funds used during construction (419.1).) (415-419, 421-421.2, 425-426.5, 408.2-411.2, 411.5,420)		
19. Allowance for funds used during construction (419.1)		
20. Total income		
Interest Charges:		
21. Interest on long-term debt (427)		
22. Amort. of debt discount & expense (428, 429)		
23. Other interest charges (430, 431)		
24. Total interest charges		
25. Income before extraordinary items		
26. Extraordinary items -Net- (434, 435, 409.3)		
27. Net Income		

3022-55-10 Rev (12-71)

Figure 4.
EXAMPLE OF RIS FORMS
(EXTRACT)

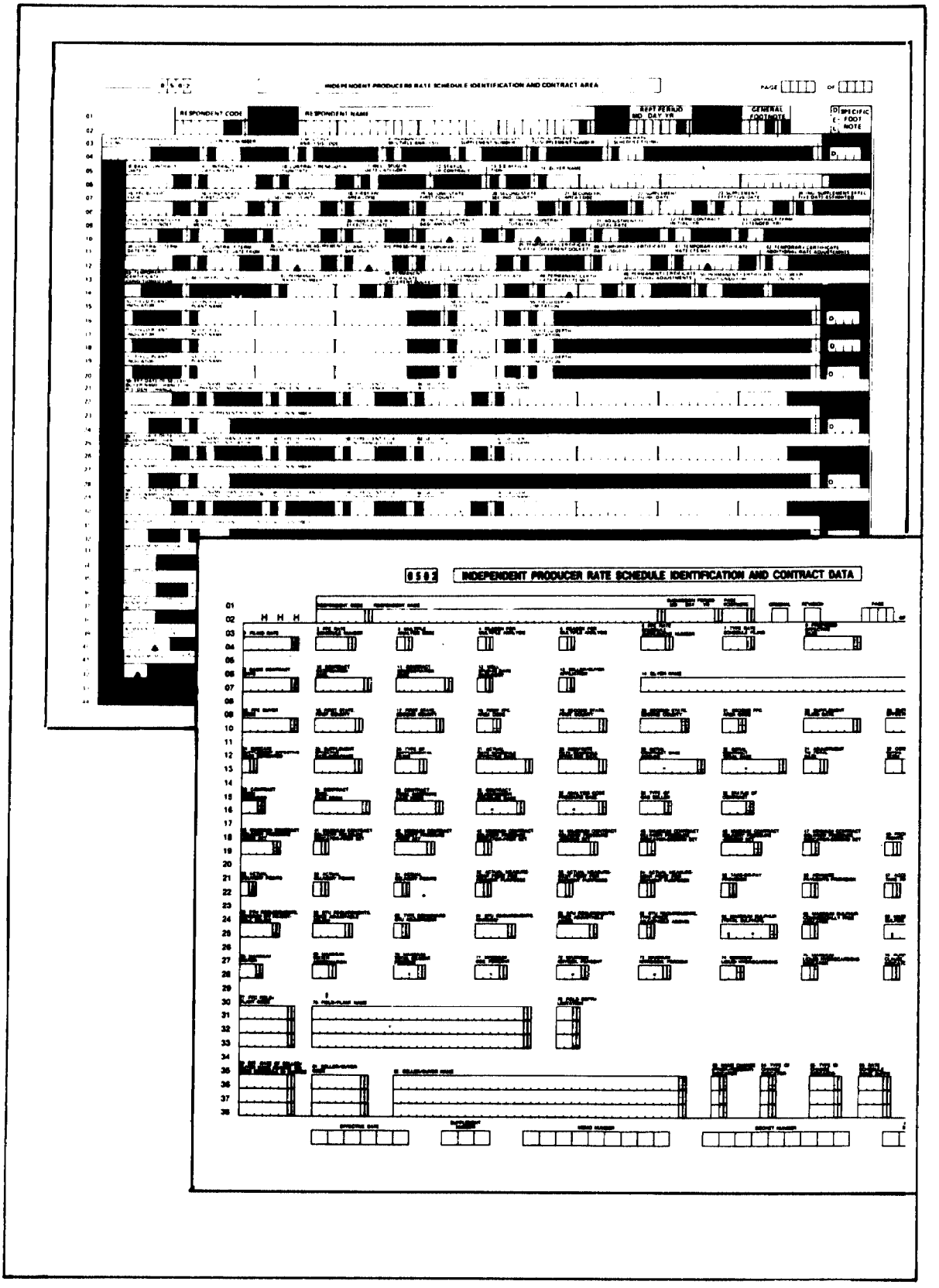

Figure 5.
EXAMPLE OF FERC FORM (EXTRACT) AFTER DECISION NOT TO CONTINUE RIS FORM DEVELOPMENT

Company Code Number	Month and Year Being Reported

PART III: INCOME DATA

Line No. (a)	Item (b)	Current Year *(In thousands of dollars)* (c)	Previous Year *(In thousands of dollars)* (d)	Footnote (e)
18	Gas Operating Revenues (400)			
19	Operation and Maintenance Expense (401, 402)			
20	Depreciation, Depletion and Amortization Expense (403-407)			
21	Taxes Other Than Income Taxes, Utility Operating Income (408.1)			
22	Total Gas Operating Expenses (401, 402, 403-407, 408.1, 409.1, 410.1, 411.1, 411.4)			
23	Net Gas Operating Revenues (Enter the result of lines 18 minus 22)			
24	Total Gas Utility Operating Income (Refer to specific instruction for line 24.)			
25	Allowance For All Funds Used During Construction - Credit (419.1, 432)			
26	Total Income Before Interest Charges (427-432) and Extraordinary Items (409.3, 434, 435)			
27	Net Income (433) Before Extraordinary Items (434, 435), Income Taxes (409.1, 409.2, 409.3, 410.1, 410.2, 411.1, 411.2), and Investment Tax Credits (411.4, 411.5, 420)			
28	Net Income (Monthly Amount Related to 433.)			

PART IV: OTHER SELECTED DATA

Line No. (a)	Item (b)	Current Year *(In thousands of dollars)* (c)	Previous Year *(In thousands of dollars)* (d)	Footnote (e)
29	Gas Utility Plant in Service (101)			
30	Accumulated Provision For Depreciation, Depletion, and Amortization of Gas Utility Plant (108, 111)			
31	Gas Plant Construction Work In Progress (107)			
32	Gross Additions To Construction Work In Progress (107) For This Month Being Reported			
33	Amount Collected Which Is Subject To Refund During This Month Being Reported			
34	Cumulative Amount Collected Since January 1 This Year Subject To Refund, At End Of This Month Being Reported			
35	Monthly Amount Subject To Refund Actually Refunded During This Month Being Reported			
36	Cumulative Amount Subject To Refund Refunded Since January 1 This Year, To The End Of This Month Being Reported			

FERC FORM NO. 11 (REVISED 2-80) Page 2 of 4

the Regulatory Information System software provided some documentation to the Federal offices. But, according to one consultant, the documentation fell into two categories--one too general and the other too detailed and complex--both useless. He characterized the documentation as "* * * possessing spiffy covers and fancy graphs and charts, [but] * * * in all candor * * * sorely lacking in real content."

Because the available documentation was not considered adequate, in March 1979 the Energy Information Administration contracted for preparation of additional documentation. However, the documentation was not delivered and this contracted effort was discontinued after June 1979 because FERC had withdrawn its support of the system. Therefore, future use of the documentation was in doubt.

According to Federal officials, technicians, and consultants, the computer software developed by the contractor for the Regulatory Information System was difficult to use. A considerable amount of time was needed to gain a working knowledge of the system's unique computer software. It required understanding the commercially acquired data base management system, the contractor-developed software, the data element directory, and how these parts were to function together as a system. Also, the computer programs were considered too complex and inflexible--causing frequent, difficult, operating problems.

Because of the complexity of the computer software and the absence of good documentation, successful operation of the software depended heavily on having technical personnel who had sufficient time to gain familiarity with it. However, when the Energy Information Administration inherited the system and the technicians who were familiar with the software, it knowingly did not replace some staff members who left. This seriously weakened, and perhaps depleted, the Energy Information Administration's technical capability to effectively use the computer software.

Despite critics' concerns that the computer software was overly complex and poorly documented, system developers--including the system's long-time project manager--remained convinced that the computer software was completely usable. Even so, the Energy Information Administration office responsible for operational computer software refused to accept this software. The office had seen no evidence of any tests or test results of the software programs, and had seen no system output capabilities. It felt that more development work was needed and that the programs were not yet "debugged."

Eventually the software labeled as operational by the developing office was replaced--or scheduled for replacement--with computer software that uses individual files and programs rather than the shared-data-base-oriented approach envisioned under the Regulatory Information System.

Formats in which data was to be used remained largely undecided

Although the system was intended to produce necessary and useful reports for Federal and State regulators and others, the format in which data was to be used remained largely undecided. The presumption was that computer-prepared reports would be better in some way than the information previously available. However, formats for most computer-prepared reports were never developed and finalized. The few reports that were developed for users were designed in essentially the same format as the data collection forms.

WEAKNESSES IN SYSTEM IMPLEMENTATION

Attempted implementation of the system was premature and largely unsuccessful. Specifically:

--The Federal Power Commission prematurely started massive data loading into computerized files still under development, with the ultimate result that the data was mostly unusable.

--The Energy Information Administration, despite lack of demonstrated success in earlier implementation attempts, tried unsuccessfully to use the system software to satisfy other DOE data needs.

Data prematurely loaded by Federal Power Commission was largely unusable

Despite the unresolved issues in the planning and development stages of the system, developers directed the contractor in 1974 to begin loading large amounts of data into the computerized files. The loading involved the use of

--existing Federal Power Commission forms, which had not yet been revised to accommodate a data base approach, and

--computerized files, which were still under development and subject to change.

The ultimate result of this premature effort was that when potential users of the system attempted to obtain the loaded data, it was mostly unusable.

The data loading continued, even though in September 1975 the contractor questioned the usefulness of such an effort. He warned that the lack of standardization in data collected on the old forms would create many problems and require considerable contact with the industry respondents--to clarify and standardize data being loaded. Standardized data in the computerized files was essential to the Regulatory Information System. Yet, the Federal Power

Commission continued the effort without contacting the respondents to clarify the information they had reported on the old forms.

To complicate matters, loading of information was performed by personnel generally unfamiliar with the type of data being loaded or with its intended use. Unfortunately, much of the data that was loaded was either incorrect, incomplete, inaccessible when needed, or not in a usable format.

Most of the information loaded into the Regulatory Information System computerized files was never used to produce meaningful or timely reports for Federal or State regulators. As discussed in chapter 2, only a few publications were ever produced from these files. The money spent to load data was therefore largely wasted. We were unable to determine exactly how much was spent for data loading. The contractor, however, informed the Federal Power Commission in July 1976 that the task was consuming an "unbelievable" amount of resources. We were advised by Federal and former contractor officials that at least $1 to $2 million was spent on loading the data.

Why was this done? It was the perception of several parties we interviewed that the system's managers were overly anxious to get data loaded into the computers and did not adequately consider the overall status of the system. Such data loading might help sustain a desired appearance that system development was progressing well.

Attempted system use by EIA was less than successful

After the Regulatory Information System was transferred to EIA, that agency attempted during 1978 and 1979 to use the system's software programs for projects other than those originally planned by the Federal Power Commission. The results were all less than satisfactory and, after short periods of time, the use of the software was abandoned because:

--The software programs, not yet ready for operational use, caused late reports and unnecessary cost.

--The number of EIA computer technicians with adequate knowledge of the programs was limited, further delaying attempts to use the programs.

--The programs were difficult, time consuming, and costly to use, according to EIA computer technicians and officials.

In one instance, the Energy Information Administration attempted from March through September 1979 to use the Regulatory Information System's software programs for processing solar energy information. The effort failed even though the agency spent over $60,000 for contracted work in addition to using its own staff.

Prompt publication of the solar energy data to be processed was critical. The contractor, however, experienced many difficulties with the system's software and discovered that some software features were not yet operational. The many problems delayed completion of the work for months. More time was lost when the only person on the project with technical knowledge about the system's software became ill.

The office responsible for the data, fearing that the software problems could not be solved in time to publish the information, began a parallel effort--developing its own software programs independent of the Regulatory Information System. By using its own programs, the office published the data on time. It continues to use its own programs for producing the semiannual publication; efforts to use the Regulatory Information System software for processing solar energy data have been abandoned.

In addition to the unsuccessful attempt to use the Regulatory Information System to process solar energy information, several attempts to use the software for other than originally planned purposes were also less than satisfactory. (See app. I.)

Why were these further implementation attempts made? Because the originally planned uses had not been successful, system developers were apparently under some pressure to demonstrate that the system was viable. In addition, the official responsible for the Regulatory Information System's software development effort was the same official who made the decision to attempt to use the software in other areas. In such a situation, a conflict of interest might exist; the official responsible for software development may want to create the appearance of progress where little or none exists by using a system not yet fully developed and ready for operation.

FEDERAL MANAGERS DID NOT EFFECTIVELY MONITOR PROGRESS AND COST

For system development efforts as ambitious as the Regulatory Information System, we believe top management should monitor (1) progress being made and (2) costs being incurred. Such a procedure allows top management to evaluate system progress and cost at critical points. Informed decisions can then be made about whether to continue system development and whether any system modifications are necessary. We doubt that Federal managers would have prolonged the system's effort for almost a decade without major changes if they had effectively monitored progress and all costs.

As far as we could determine, the Federal Power Commission did not separately account for all Regulatory Information System costs and periodically report progress to top management. Costs incurred under the main system development contract could be identified, but records of other system-related costs were not carefully maintained. As discussed in chapter 2, the Federal Power

Commission reported to the Congress and others, often erroneously, that significant progress was being made. However, more detailed reports of progress and problems being encountered in system development were apparently not periodically made to the Commission's top management.

When the Energy Information Administration inherited primary responsibility for the system, considerable slippage in the effort had already occurred. Also, a review by the Federal Paperwork Commission and our followup review had highlighted major problems in the proposed reporting requirements. Even so, EIA did not establish effective procedures to carefully track the progress of the Regulatory Information System and all associated costs.

In commenting on our draft report, the Department of Energy referred to various systems and procedures it said EIA used to track the progress and cost of the Regulatory Information System. However, these systems and procedures did not provide an accurate and complete record of total costs incurred, progress made, or problems encountered in trying to develop the system.

In evaluating the tracking systems and procedures which the Department said EIA relied upon, we found that:

--A Resource Accountability System intended to monitor cost did not provide a clear and readily accessible record of all Regulatory Information System related costs.

--A Project Accountability System intended to monitor major projects at EIA's level gave only limited information on Regulatory Information System development and indicated that the system had been implemented in February 1979. It did not report the serious problems associated with the system.

--The Secretary's Action Coordination and Tracking System, intended to monitor major projects at the Secretary of Energy level, did not begin to monitor Regulatory Information System progress until November 1978. More significantly, we found only one progress report on the system and no record of action taken, even though planned milestones had not been met.

--Project Evaluation Review Technique status reports on Regulatory Information System progress were prepared seven times between August 1978 and April 1979. However, the evaluation addressed only reporting forms and indicated that significant progress "was being made on the RIS effort" in April 1979.

Although the Department also commented that both EIA and FERC top management monitored system progress through biweekly status reviews, records of the dates of such reviews, conclusions reached, or actions recommended were not available at either organization.

We do not believe that the systems and procedures used by the Energy Information Administration to track Regulatory Information System cost and progress were effective. In the absence of effective tracking procedures, top management at EIA took or permitted actions which appear to be contradictory. For example, EIA

--in 1978, hired three consultants to study the usefulness of the system, indicating its doubt as to the system's viability;

--in 1978 and 1979, failed to replace departing technical personnel who were familiar with the system, seriously weakening its capacity to use the system; but

--continued until 1979 to expend additional Federal funds on further system development.

Top EIA officials did not have accurate information on the progress and cost of the system, which prevented them from making fully informed decisions. Therefore, the following questions can be raised: Would Federal managers have prolonged effort on the system for almost a decade if accurate information on progress and cost had been available? What modifications would they have made in the effort?

CORRECTIVE ACTION WAS NOT TAKEN EVEN AFTER PROBLEMS WERE IDENTIFIED

The management weaknesses we have described persisted even though problems were identified both before and after the Energy Information Administration assumed primary development responsibility in October 1977.

Commission on Federal Paperwork reviewed and criticized the proposed reporting requirements

The Federal proponents of the Regulatory Information System believed the system would be so valuable that it could serve as a model for other Federal agencies. From that viewpoint, the project manager invited the Commission on Federal Paperwork to review progress being made toward the system's development. From the opposite viewpoint, representatives of the regulated industry had expressed concern to the paperwork commission that the proposed reporting requirements would be overly burdensome to them. The possibility of the Regulatory Information System ever serving as a model for paperwork reduction became very doubtful after the paperwork commission--based on its 1976 review of the potential reporting burden for industry--criticized the Federal Power Commission for

--underestimating the system's ultimate cost to the industry,

--not consulting widely enough with the regulated industry,

--not adequately coordinating its effort with State regulators, and

--planning to require additional data from industry without adequately substantiating the need.

The Commission on Federal Paperwork criticized many of the planned reporting requirements as potentially overburdening to industry, and stated that more coordination with industry was needed. Further, the staff of the paperwork commission concluded that the Regulatory Information System--had it been implemented as planned at that time--could have cost the regulated industries an estimated $450 million in additional reporting burden.

Because of the possibility of duplicate reporting requirements, the paperwork commission was also concerned about the level of coordination with State regulatory commissions. Many of these commissions were using Federal Power Commission forms to perform their regulatory functions. One major justification for continuing the development of the Regulatory Information System was that State regulatory commissions could use the system--which would lower their costs and improve their regulatory effectiveness. However, the paperwork commission found that--although several general meetings were held with State representatives during the nearly 5 years of development--State commission representatives had been given no opportunity to discuss the specific data requirements. A danger therefore existed that States might not accept the Regulatory Information System and would continue to require their own forms even if they became duplicative.

The Commission on Federal Paperwork, on December 3, 1976, adopted a resolution applauding the objectives of the Regulatory Information System as a major step forward in the effective use of computers to support regulatory activities. However, the resolution also stated that implementation plans for the system were less than adequate. It requested the Federal Power Commission to

--develop an effective forum for discussion between the Federal Power Commission and other parties interested in the system,

--demonstrate the cost benefit for the new data requirements to be collected from industry,

--coordinate with State regulatory commissions before changing any of the Federal Power Commission forms the States were also using, and

--pilot test the reporting forms, with the active involvement of industry and other interested parties, before implementing them industrywide.

The Federal Power Commission agreed to take these actions.

GAO followed up and found problems were not fully corrected

During 1977, we did limited monitoring to determine whether the Federal Power Commission was taking the actions it had promised and found that much remained to be done. Our work in 1977 was restricted to reviewing the actions taken in response to the paperwork commission's recommendations and did not include an assessment of overall system development.

Based on our limited work, we described the Federal Power Commission's corrective actions in a September 30, 1977, letter to the Chairman of the Commission on Federal Paperwork. 1/ For example, 12 technical conferences had been held in selected cities to discuss with interested parties some proposed reporting forms, and some forms had been pilot tested with selected companies. In addition, brief visits had been made to State regulatory commissions to generally explain the proposed system.

We concluded that the actions taken had improved the system and reduced the potential burden on industry respondents, but also recognized that more remained to be done before the reporting forms could be approved. For example, we noted that the Federal Power Commission had not yet ensured precise definitions of data required from industry. During the pilot test, industry participants gave varying interpretations to some requirements, raising the possibility that the new forms would not produce the valid data needed by the Commission. We also noted that this should have been done in the first stages of system development rather than at this late stage. Also, there was still a need to identify the data the Commission needed to perform its functions efficiently and effectively, and to estimate the burden the system would place on industry.

After EIA involvement, consultants found that problems still continued

Rather than expeditiously resolving problems already identified, EIA contracted with three separate consultants to further study the system's usefulness. These consultants confirmed the existence of serious problems, some of which had been articulated by those aware of the system virtually from its inception.

The consultants' three reports, submitted between October 1978 and March 1979, identified many of the same problems we did during this review and in our earlier work. For example, one consultant recommended that a "phased approach should replace the present approach of trying to incorporate partial aspects of all

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1/Letter report to the Chairman, Commission on Federal Paperwork (GGD-77-95, Sept. 30, 1977).

possible data in hopes that the ideal whole will materialize * * *." The consultant further said that the current unphased approach "is resulting in such a level of dismay among the users that none will be around should the perfect version ever be forthcoming."

Many problems identified by the consultants were already known and should have been corrected through more effective management by EIA. The adverse effects of continuing management weaknesses still had not been resolved when EIA stopped system development in September 1979 and incorrectly characterized the system as operational.

OTHER DISRUPTIVE INFLUENCES WORKED AGAINST SYSTEM SUCCESS

Over the lengthy period during which development of the Regulatory Information System was attempted, other factors came into play. Three factors that worked against success were:

--A breakdown in communication and coordination among system developers and planned users of the system.

--The absence of continuous involvement and support from top Federal management.

--Organizational changes and personnel disruptions.

Breakdown in communication seriously hurt the system effort

For a variety of reasons, a serious breakdown in communication and coordination occurred in developing the Regulatory Information System and worked strongly against its success. Many individuals and organizational elements were to be affected by--and therefore should have been involved in developing--the ambitious Regulatory Information System, even more so because a contractor was involved. Effective communication and coordination within Federal offices and between the contractor and these offices was essential, both at system inception and throughout system development, if success was to be assured.

According to the planned users of the system that we interviewed, they had too few opportunities to participate in system design and development. On the other hand, many of those involved in developing the complex system complained that many planned users refused to cooperate in the development. This problem was discussed in two consultants' reports submitted to EIA.

According to one consultant's report, "even if RIS were to be a technically perfect information system, the extremely hostile atmosphere between developers and users would probably mitigate against its effective use." The relationship between the development staff and the user community was characterized as "poisonous"

by the consultant. Our discussions with Federal employees and contractor personnel confirmed that a very hostile environment had developed.

Why did communication and coordination fall into such a serious state? We found several possible explanations. In the words of one Federal official, it became a "war between certain 'crusty old bureaucrats' [the users] at the Federal Power Commission and the 'computer jocks' [the developers]." The former group was perhaps too firmly set in the existing ways and generally unfamiliar with computer concepts. The latter, on the other hand, was generally unfamiliar with the regulatory environment and the information to be processed and also perhaps guilty of wanting to move too rapidly without gaining needed support from all affected parties.

There were other factors in the communication breakdown. For example, according to several officials, the system's project manager never gained the confidence and cooperation of middle managers and staff at the Federal Power Commission. The system's managers were criticized by some for operating secretively and for "steamrollering" the project--thus alienating the Commission's middle managers and some contractor personnel.

Important communication link with States was missing

In addition to the poor coordination and communication within Federal offices and between Federal offices and the contractor, another important group--the State regulatory commissions--were never adequately brought into the system development effort. This is particularly significant since States were to be one of the primary beneficiaries of the system and their planned use of the system served as a selling point for continuing system development. Although several States were initially enthusiastic about the system, the continued low level of involvement and inadequacy of communication, despite the recommendations of the Commission on Federal Paperwork (pp. 29-30), ultimately led to the disillusionment--if not alienation--of many State regulatory commissions.

In response to a recommendation of the Commission on Federal Paperwork, the Federal Power Commission undertook a project in January 1977 to gain better support for the system, but the project did not succeed. It consisted of short visits, usually 2 days each, to 47 State regulatory commissions and the District of Columbia. These visits were superficial--again addressing only a general system overview as in prior contacts--and did not result in firm commitments to use the system.

Since the 1977 visits, many State regulatory commissions, often left without a clear understanding of the status of the system, have been dissatisfied with their level of participation. During our review, we sent a questionnaire to the State commissions asking for their views of the Regulatory Information System.

Responses to the questionnaire indicated that State commission participation never reached an acceptable level. For example:

--Out of 23 commissions responding to the question, only 7 said they were satisfied with their level of participation while 16 said they were either dissatisfied or only marginally satisfied.

--Out of 24 commissions responding to the question, 2 believed their participation would have only a moderate impact while 17 believed their participation would have little or no impact, and 5 said it was too early to judge.

The composite results of the questionnaire appear in appendix II. Since the questionnaire was sent out early in our review, we made followup calls in 1980 to most State regulatory commissions. Responses indicated that State regulatory commissions still remained uninformed about the status of the system.

For a variety of reasons, then, communication and coordination among the various parties whose support was needed to implement the Regulatory Information System got off to a poor start and apparently got progressively worse. This was clearly a major factor working against successful development of the system.

Top management support faded over the years

While top management support was clearly evident at the system's inception in 1972, it seems to have faded after a few years.

A prerequisite to successful system development is early and continuous upper management support. Work on the Regulatory Information System was initiated in 1972 because of the direct and personal interest of the Chairman of the Federal Power Commission. The Chairman designated a project manager for the system effort and made it clear that the project manager had his full support.

A new Chairman was appointed to the Federal Power Commission in 1975, and while it was not clear how supportive he was of the system concept, he did retain the same project manager. According to one consultant, the Federal Power Commission's upper management took a rather lackadaisical attitude toward the system's development in the period of turmoil and uncertainty that led to the 1977 establishment of the new Federal Energy Regulatory Commission.

After the Energy Information Administration assumed responsibility for the system in October 1977, there were indications that its top management assigned relatively low priority to getting the system operational. A review of the system at that time by the new FERC's management was geared mainly toward trying to determine what the system could produce. When concrete results seemed difficult to obtain, and in light of reduced data needs, FERC's top management chose not to push for further system development.

Disruptions in organization and personnel also hurt system development

This system also suffered from some disruptions in both organization and personnel. Most of these--though not all--were beyond management control.

We refer earlier in this report to major organizational changes, including creation of the Department of Energy and the Federal Energy Regulatory Commission in 1977. Any organizational change of such magnitude would have an impact on major ongoing projects, such as development of the Regulatory Information System.

Due to these organizational changes and for other reasons, there were some changes in technical personnel assigned to develop and implement the Regulatory Information System. A system as complex as the one envisioned, and with such potentially far-reaching impact, ideally should have the maximum possible continuity of assigned personnel. After EIA assumed major developmental responsibility, however, it did not replace knowledgeable personnel who had left. On the other hand, the system's project manager and his chief assistant continued in their capacities into 1979.

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Clearly, many diverse factors led to the demise of the Regulatory Information System. To categorize their relative influence would be impossible. But the factors discussed in this chapter, when taken collectively, clearly made the successful implementation of the system impossible.

CHAPTER 4

PROCEDURES FOR DEVELOPING ENERGY INFORMATION SYSTEMS SHOULD BE REVIEWED

Having reviewed the lengthy and costly effort to develop the Regulatory Information System, its ultimate collapse, and some of the reasons, one might ask: Can it happen again? The Department of Energy thinks not, but we believe it would be useful for the Energy Information Administration to review its management of system development efforts.

Development of the Regulatory Information System was started in the early 1970s by the Federal Power Commission, which continued development work through October 1977. EIA cannot be held accountable for the many management deficiencies that occurred before that date, which undoubtedly contributed greatly to the system's ultimate demise. Yet EIA managed the system's development for 2 years and is currently responsible for managing the development of other major energy information systems for the Federal Energy Regulatory Commission and for others. It therefore seems appropriate that EIA study the Regulatory Information System experience to ensure that similar problems do not recur elsewhere.

ENERGY INFORMATION ADMINISTRATION MANAGES SYSTEM DEVELOPMENT DIFFERENTLY THAN FEDERAL POWER COMMISSION

In the opinion of EIA officials, there is little likelihood of recurrence of problems of the magnitude of those experienced in the ill-fated attempt to develop the Regulatory Information System. The officials emphasized that the most serious management weaknesses involved in that experience occurred under the Federal Power Commission--not under EIA--in the earlier stages of development. EIA officials contend that its management practices are far better, particularly in the critical early stages of development, than were the Commission's.

In commenting on our draft report, the Department of Energy stated that EIA uses formal reviews to oversee management throughout the life cycle of system development; specifically

--a Procurement Review Board to review all EIA contracts before they are awarded,

--a Data Requirements Review Board to review all major data collection efforts and complex data issues, and

--a Project Accountability System to monitor schedules and milestones.

If used effectively, each of these formal reviews has management value. However, EIA has not established procedures to review all systems under development to ensure that they will meet user needs in a cost-beneficial manner and that there is adequate coordination between system developers and intended users throughout the development cycle.

Procurement Review Board looks only at nontechnical aspects of proposed procurements

The Procurement Review Board was established by EIA in June 1978 to assess procurement proposals in excess of $100,000 ($25,000, if sole-source). The Board is not intended to make decisions on technical merits of proposals; rather, it is concerned with procedural, administrative, and legal issues. Our review of minutes of meetings confirmed that the Procurement Review Board's reviews are limited to nontechnical aspects of proposed procurements. Moreover, after procurements are approved the Board has no further oversight role.

Data Requirements Review Board looks at complex data issues--but only selectively

The Data Requirements Review Board was formally established by EIA in June 1980, although it had operated informally since April 1980. The Board is intended to provide early policy and technical review of new energy data systems, proposed modifications to or eliminations of existing energy data systems, and other issues related to major data collection. If used effectively, the Data Requirements Review Board can serve a valuable management function with EIA. However, the Board does not routinely review all data collection activities; it confines itself to selective review of those topics or issues that individual Board members raise for consideration.

The Data Requirements Review Board held six meetings between April 1980 and January 1981, at which a total of 10 topics or issues were discussed. The issues included general need for certain information collected from outside DOE, changes in reporting formats, and a definition of the United States for reporting purposes. The Board did not address user needs in detail, the possible need for a cost-benefit analysis of information collected, or progress in developing systems to be used by EIA in processing the information it collects.

Project Accountability System monitors major projects but does not ensure followup on problems

The Project Accountability System was formally established by EIA in January 1979. The system's intended objectives are to:

--Track from initiation to completion all projects requiring EIA resources.

--Provide a central registry of all past, current, and future projects requiring significant resources.

--Identify all reports and analyses prepared by EIA for DOE, the executive branch, and the Congress.

--Provide senior and middle management with a mechanism to monitor progress on major projects and allocate EIA resources.

For those projects that are entered into the system, the Project Accountability System provides status reports at periodic intervals.

The Project Accountability System can also be useful to management in monitoring major EIA projects. However, the value of its contribution depends on how well EIA officials use the system; for example, whether responsible officials ensure that accurate and timely data on projects is being entered. As discussed on page 28, the status reports produced from the system did not provide an accurate or complete account of the serious problems being faced in developing the Regulatory Information System. Even if the Project Accountability System produces accurate status reports, a need still exists for appropriate and effective EIA management actions--including ongoing coordination between system developers and intended users--at all stages of system development.

In addition to the Procurement Review Board, the Data Requirements Review Board, and the Project Accountability System, DOE stated that EIA's management oversight of system development benefits from two non-EIA reviews:

--Peer review and outside expertise obtained for selected EIA systems through frequent participation with the American Statistical Association's Ad Hoc Committee on Energy Statistics.

--OMB's information collection budget process, to which EIA is subject.

Whatever the merits of these two review processes, we believe they are too far removed from EIA's day-to-day management to provide timely detection of the types of system development problems discussed in this report.

In our view, the formal reviews to which DOE refers have management value but do not adequately address key system development considerations on an ongoing basis. By themselves, these reviews would not have identified all the problems associated with Regulatory Information System development.

EIA COULD BENEFIT FROM REVIEWING ITS MANAGEMENT PRACTICES

EIA has a different approach to the management of system development than did the Federal Power Commission. Accordingly, we do not take a pessimistic view toward possible recurrence of all the problems associated with the Regulatory Information System. Yet some factors indicate that EIA might profit from an indepth review of how it manages the development of energy information systems. Consider, for example, that:

--Recent reviews of two other systems being developed by EIA identified problems similar to those that occurred in the attempted Regulatory Information System development.

--Weak contract administration practices, which affected the major Regulatory Information System contract, were recently reported as prevalent within the Department of Energy. 1/

--Many other problems we noted were recently found to be common occurrences when the Federal Government contracts to develop computer software 2/, as it did for the Regulatory Information System.

TWO OTHER EIA SYSTEMS HAVE BEEN CRITICIZED FOR SIMILAR PROBLEMS

EIA efforts to develop two other major systems have recently been criticized for problems similar to some we found in the development of the Regulatory Information System.

Financial Reporting System was criticized by GAO

EIA is developing and implementing a Financial Reporting System, in accordance with requirements of the Department of Energy Organization Act of 1977. This system is to provide, periodically, annual financial and operating performance data on companies in energy-related industries.

1/"The Department of Energy's Practices for Awarding and Administering Contracts Need to be Improved" (EMD-80-2, Nov. 2, 1979).

2/"Contracting for Computer Software Development--Serious Problems Require Management Attention to Avoid Wasting Additional Millions" (FGMSD-80-4, Nov. 9, 1979).

Earlier, we reviewed development of the Financial Reporting System and issued two reports critical of the effort. 1/ Our principal concerns were that the agency had neither adequately defined its data needs nor sufficiently planned the use it would make of the data collected. Both weaknesses were also present in the attempt to develop and implement the Regulatory Information System.

EIA believes that problems we identified regarding the Financial Reporting System have since been resolved. The system began producing reports in 1980. Even so, the problems with the Financial Reporting System indicate that problems in EIA management of system development have not been restricted solely to the Regulatory Information System.

National Energy Information System was criticized by the Professional Audit Review Team

Since 1976, EIA has been developing the National Energy Information System, in accordance with the requirements of the Energy Conservation and Production Act. This system is to provide an authoritative source of adequate, accurate, comparable, coordinated, and credible energy information within the Government.

More recently, another audit team reviewed and criticized EIA's development of the legislatively mandated National Energy Information System. The Professional Audit Review Team, which was established by the same legislation and includes GAO participants, issued its somewhat critical report in November 1980. The report noted that only limited progress had been made in developing the National Energy Information System, even though nearly 4 years had passed since enactment of the legislation. 2/

The developers of the National Energy Information System had not solicited the formal views of the system's intended users. The Professional Audit Review Team believed that this should have been done. One of the major problems in developing the Regulatory Information System was that the users' needs were never clearly defined. (See p. 18.)

In response to the Team's criticism, EIA stated it had solicited potential users, both formally and informally, with regard

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1/"Improvements Needed in the Department of Energy's Efforts To Develop A Financial Reporting System" (EMD-78-95, July 31, 1978); and letter report on the Financial Reporting System (EMD-78-112, Nov. 1, 1978).

2/"Activities of The Energy Information Administration" (Nov. 13, 1980), Professional Audit Review Team's report to the President and the Congress.

to their data needs. But the Team disagreed, stating that EIA should conduct user surveys to determine what information users would hope to obtain from the system.

The Financial Reporting System and the National Energy Information System are only two of many systems under development. But they are large, important systems. The problems identified in these two systems, coupled with our observations regarding the Regulatory Information System, should alert EIA top management to be watchful for recurrence of these mistakes and deficiencies.

CHAPTER 5

CONCLUSIONS, RECOMMENDATIONS, AGENCY COMMENTS, AND OUR EVALUATION

CONCLUSIONS

The ambitiously planned Regulatory Information System--despite an investment of many millions of dollars over nearly a decade--delivered virtually none of the many benefits that had been repeatedly promised for regulators, the regulated industry, and others. When Federal officials decided in 1979 to cease further investment in the system, they had few other options since the results achieved had been so meager and there were still huge obstacles to the system's ever becoming successfully operational as planned. However, even if no realistic alternative existed at that time, we believe State regulators, industry representatives, and others who were anticipating the system's promised benefits--which are now not forthcoming--should be told what happened to this once highly touted system. Also, because the Energy Information Administration is developing other similar systems, we believe the costly and largely unsuccessful outcome of the Regulatory Information System experience should spur EIA to reevaluate its system management approaches.

Why did this long and costly system development effort fail? The reasons were many and varied. More effective Federal management practices should have precluded many deficiencies, such as lack of early validation of the needs of system users, the absence of a cost-benefit approach, inadequate communication between system developers and would-be users, and inadequate participation of State regulatory commissions in system design. Some contributing factors, such as organizational changes and personnel disruptions, perhaps were unavoidable.

Because many basic management weaknesses had negatively affected progress on the system while it was managed by the Federal Power Commission, EIA in 1977 inherited a system already fraught with problems. The situation therefore presented a huge management challenge. On the other hand, EIA had the advantage of knowing immediately through our earlier reviews and that of the Commission on Federal Paperwork, as well as other comments, what many of the system's problems were. Likewise, the Federal Energy Regulatory Commission, the intended primary user, shared this knowledge.

EIA, therefore, should have been in a position to move aggressively to work on necessary solutions. It did not. It waited until 1979, and by then the combination of technical problems and loss of confidence of various parties probably dictated that only one move was realistic: to cease development of the system.

Many interested parties outside the Government, including State regulatory commissions, regulated industries, and others, have not been advised that EIA is no longer pursuing the system's development. On the one hand, the 1973 Federal Power Commission order to develop the system has been left standing and an internal EIA memorandum in September 1979 labeled the system as operational. On the other hand, the system is producing no substantive results and EIA has no plans for its future use. Therefore, the current status of the system and its future use remain uncertain except to those knowledgeable of it within EIA. We believe EIA should issue a formal notice clarifying the system's status to avoid the possibility of further misleading the interested public.

A formal notice on the status of the Regulatory Information System could also serve other purposes. It could, for example, provide a better record of accountability of a very large expenditure of Federal funds. In addition, EIA could use the public notice to describe what original objectives of the system, if any, it still considers worthwhile and how it intends to achieve them. Moreover, EIA may wish to comment in a public notice on how its approach to system development differs from that used by the Federal Power Commission.

Some parties may now view the experience of the Regulatory Information System as history--"water over the dam." We feel it is important to raise the question: Could it happen again? We are not unduly pessimistic about the possibility of recurrence, but EIA is now developing several other energy information systems with contractor assistance, and at least two have been criticized for some of the same problems we noted in our review of the Regulatory Information System.

While EIA's system development procedures appear to be better than those of the Federal Power Commission's in the early 1970s, the Regulatory Information System experience dramatically shows that large amounts of Federal funds can be wasted when large system development efforts are not carefully managed at all stages. Since EIA has a continuing responsibility to develop other large and important energy information systems, it should take every reasonable precaution to avoid the recurrence of critical problems. Based on EIA's 2-year management of this system development, and problems identified in two other systems now being developed by EIA, we are not convinced that EIA's current procedures ensure the avoidance of key system development problems, such as inadequate identification of the intended users' needs and inadequate coordination of system developers and users. Moreover, even good procedures require constant vigilance.

RECOMMENDATIONS

We believe the Secretary of Energy needs to take action to ensure that the management weaknesses that led to such a long and costly yet unsuccessful attempt to develop the Regulatory Information System are not repeated. We therefore recommend that the

Secretary have the Adminstrator, Energy Information Administration do the following:

--Formally document and communicate to the interested public plans for the future use, if any, of the Regulatory Information System concept and the computer software developed, giving reasons for the actions to be taken.

--Establish procedures for reviewing the development of current and future energy information systems. The review procedures should stress the importance of assuring that (1) user requirements are adequately identified, (2) appropriate cost-benefit analyses are performed, (3) plans are prepared for each stage of the system development work, and (4) the work of system developers and the needs of system users are coordinated throughout the development effort.

AGENCY COMMENTS AND OUR EVALUATION

The Acting Chairman of the Federal Energy Regulatory Commission had no substantive comments on our report. FERC said the accuracy of the facts should be confirmed or denied by the Energy Information Administration. However, FERC expressed a willingness to cooperate in any program designed to implement our recommendations. (See app. III.)

The Department of Energy strongly disagreed with our conclusions and recommendations. The Department questioned the usefulness of issuing this report since (1) the Federal Power Commission, which was primarily responsible for the development of the Regulatory Information System, no longer exists, and (2) the Energy Information Administration can be assigned only a very small portion of the costs of that system. Also, the Department said the report wrongly intimates that ongoing EIA systems development projects are tainted by the Regulatory Information System experience. (See app. IV.)

We are issuing this report on the Regulatory Information System because

--large amounts of Federal funds were invested in the system with few results and EIA was partially responsible,

--the many intended users of the system have not been given an explanation as to what happened to it, and

--the lessons learned from this experience should be applied in managing other system development efforts.

We recognize that the Federal Power Commission initiated Regulatory Information System development, and that it spent more time and money than did the Energy Information Administration. Yet, EIA did continue development efforts at a significant cost for about 2 years. We believe EIA management should have acted

sooner and more effectively in dealing with the problems of the system.

We do not believe that ongoing EIA system development projects are tainted by the Regulatory Information System experience. However, we do believe problems associated with EIA's management of this system, coupled with other recent criticisms discussed in chapter 4, suggest the need for reviewing the development of other energy information systems. We have no preconceived notion of the outcome of a review of other systems under development by EIA.

DOE sees our first recommendation as a moot point

The Department of Energy rejected our recommendation that EIA formally document and communicate plans for future use of the Regulatory Information System. The Department considered this a moot point, since it said EIA plans no future use of the system. We find the Department's position puzzling in view of considerable publicity given the system for several years and the large number of non-DOE individuals involved or affected by the system.

Those who were to have benefited from the proposed system were repeatedly advised over the years that operation was imminent and that beneficial results would be forthcoming. While this type of communication was more prevalent during the years the Federal Power Commission managed the system, at least two senior EIA officials were still advising both industry and State representatives as late as 1979 that the system's successful operation was imminent.

Despite the repeated delays and ultimate collapse of the Regulatory Information System, EIA has chosen not to provide a formal notice to parties interested in the system. We believe the interested public is entitled to be informed of the final disposition of projects that involve substantial expenditures of Federal funds and create expectations of major change affecting parties outside the Federal Government. As a minimum, we believe that the interested public should be formally advised that EIA is no longer pursuing the Regulatory Information System concept. Otherwise, those parties will remain uncertain as to what to expect and what consideration to give to the system concept as it relates to their own operations.

DOE sees no need for our second recommendation

The Department of Energy also rejected our second recommendation, stating that EIA has in place a very clear and comprehensive set of standards and operating procedures to which every system development effort must conform. The Department referred to several formal reviews which it said provides management oversight throughout the life cycle of system development.

We recognize that EIA performs formal reviews that can have management value. They are discussed in detail in chapter 4 (pp. 36-38). However, the goals of the formal review to which DOE refers do not fully address the potential for problems such as the ones that arose during development of the Regulatory Information System and two other major systems. The formal reviews do not provide ongoing assurance that systems under development by EIA will meet user needs in a cost-beneficial manner and that there is adequate coordination between system developers and system users throughout the development cycle.

In view of the importance of EIA's role in system development work and the large amount of Federal funds involved, we believe EIA should implement our recommendation. To assist in developing appropriately comprehensive review procedures, we are providing EIA with copies of an earlier GAO publication that is very relevant. The August 1976 publication, "Lessons Learned About Acquiring Financial Management and Other Information Systems," is based on the experiences of a wide range of Federal and non-Federal representatives who collectively had a large amount of knowledge and experience in contracting for the development of computer-based management information systems. Through an overall assessment of those experiences, the publication identifies the necessary prerequisites to successful implementation of such systems. We believe it should be very useful to EIA in establishing effective procedures for reviewing the development of energy information systems.

APPENDIX I

REGULATORY INFORMATION SYSTEM

Data Files Originally Planned And
Actual Development, Implementation, And Use Through August 1980

Data base description	Origin of data form (note a)	Data loaded	Trial report produced	Final report produced	Remarks
1. Corporate, Financial, and Economic Information File:					
Corporate and economic data	FPC-1,5	Yes	Yes	No	As before initiation of RIS, annual and monthly statistical reports continue to be produced independent of RIS central data base and RIS software; post-1976 statistical data (about 1/3 of form) from forms 1 and 2, and all of forms 5 and 11, equivalent to published reports, loaded into data file; prior years data also loaded into file, but since dropped; FPC/FERC data users tested 100 computer printouts but could not use because of "bad data."
	FPC-2,11	Yes	Yes	No	
	FPC-1F,1M	No	No	No	
	FPC-2A	No	No	No	
2. Electric Operating Information File:					
Electric plant data	FPC-4	Yes	Yes	No	As before initiation of RIS, statistical and other reports continue to be produced independent of RIS central data base and RIS software; forms 4 and 423 data for 1973-1977 loaded into data file.
	FPC-423	Yes	Yes	No	
	FPC-12	Yes	No	No	
Electric utility data	FPC-3	Yes	-	Yes	One annual report due 6/79 issued 10/79 with 14 statistical tables generated by use of RIS central data base and RIS software; 1980 annual report scheduled to be produced in same way; two additional EIA internal-use tables also generated. Prior to 1979, annual report produced independent of RIS, as it will be post-1980.
	FPC-3A,82	No	No	No	Forms eliminated in 1980.
Hydroelectric projects resource assessment data	FPC-4557	Yes	Yes	No	To date, test computer printouts only; planned 1980 publication to use RIS central data base and RIS software.
Licensed projects annual data	FPC-9	No	No	No	Plans to automate data dropped; form discontinued 10/79.
Licensed projects development data	FPC-80	Yes	-	Yes	RIS software not used to produce biennial report issued in 1978; issuance of report not planned for 1980; data for 1973, 1975, 1977, and 1979 loaded into RIS file; 15 statistical summaries for internal FERC and Department of Agriculture use were generated using RIS central data base and RIS software.

a/As part of the RIS effort, all data collection forms were scheduled to be revised. Proposed revised formats were developed over the years; however, only FPC form 108 was issued before the revision effort was abandoned in 1979.

APPENDIX I

Data base description	Origin of data form	Data loaded	Trial report produced	Final report produced	Remarks
3. Gas Operating Information File:					
Natural gas pipeline data	FPC-15	Yes	-	Yes	Two annual reports have been issued 6/79 (1977 data) and 4/80 (1978 data) with 4 of 31 tables each generated by use of RIS central data base and RIS software; as before the initiation of RIS, the remaining 27 tables continue to be generated independent of RIS central data base and RIS software.
Natural gas pipeline data	FPC-16	Yes	No	No	RIS software use discontinued after unsuccessful attempt to use RIS central data base; non-RIS data file and non-RIS software now used.
	FPC-2,11	No	No	No	
Natural gas producer data	FPC-108	Yes	Yes	No	Revised RIS-related reporting format issued in 1976; only use of RIS as originally planned; 50 test computer printouts produced with poor results ("bad data"); several schedules cancelled and data loading suspended in 1979.
	FPC-301A, 301B	Yes	Yes	No	Data base not used ("bad data" loaded); forms discontinued in 1976 and data subsequently collected on form 108.
	FPC-314A	No	No	No	Form discontinued in 1976. Attempt to automate data failed.
	FPC-314B	No	No	No	Plans to automate data dropped.
First sales of natural gas	FERC-122, 123, 124, 125	Yes Yes	No No	No No	Forms issued 3/79; only limited amount of data loaded into RIS central data base, but nothing produced; RIS use discontinued 5/80 and non-RIS data file and non-RIS software now used.
Interim pricing tracking system	FERC-121	No	No	No	RIS considered but not used.
4. Environmental Information File:					
Electric environmental data	FPC-67	No	No	No	Data file planned; never implemented.
5. Legal Information File	-	No	No	No	Data file planned; never implemented.
6. Internal Administrative Information File	-	No	No	No	Data file planned; never implemented.
7. Other minor files:					
Data base for form 6	FPC-6	No	No	No	Plans to automate data dropped; form discontinued 10/79.
Data base for form 7	FPC-7	No	No	No	Plans to automate data dropped; form discontinued 10/79.

APPENDIX I

REGULATORY INFORMATION SYSTEM

Additional Use Of The System After October 1977

Date base description	Origin of data form	Data loaded	Trial report produced	Final report produced	Remarks
Emergency technological data	-	Yes	Yes	No	Used for testing only; RIS use dropped.
Respondent emergency systems consumption data	-	No	No	No	Data base used for systems demonstration; RIS not selected.
Solar collector manufacturers data	EIA-63	No	No	No	RIS use discontinued after unsuccessful attempt to use RIS software; non-RIS data file and non-RIS software now used.
Oil and gas reserve data	-	Yes	-	Yes	One-time project; data from tapes loaded into file with modified RIS software; one EIA internal-use statistical summary report produced in 1978, using RIS file and non-RIS software.
International energy agency data	-	Yes	-	Yes	Data loaded into file using RIS software; several DOE internal-use summary reports generated using RIS file and non-RIS software; RIS use discontinued 9/79 after 8 months; non-RIS data file and non-RIS software now used.
Financial reporting systems data	EIA-28	No	Yes	No	RIS software used only for data editing; one data file and multiple intermediate computer printouts produced for data edit reviews; RIS software use discontinued 5/80; non-RIS software now used. (See DOE comment, app. IV, p. 68, for more details.)

APPENDIX II

U.S. GENERAL ACCOUNTING OFFICE
SURVEY OF STATE
REGULATORY COMMISSIONS

SECTION II: ENERGY INDUSTRY

INSTRUCTIONS

Please answer each of the following questions as frankly and completely as possible. There is space at the end of each segment for any comments you may wish to make concerning the questionnaire, or any other related topics. Responding to the questionnaire should not require research and each segment should take about 30 minutes or less of your time.

Throughout this questionnaire, there are numbers printed within parentheses to assist our keypunchers in coding responses for computer analysis. Please disregard these numbers.

We would appreciate the completion and return of the questionnaire in the enclosed envelope by May 15, 1979. If you have any questions, please call Mr. Thomas F. O'Connor or Ms. Janet Ferrell on (202) 275-5293.

APPENDIX II

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SECTION II: ENERGY INDUSTRY

INTRODUCTION

In 1971 the Federal Power Commission (FPC) conducted a study to ascertain the feasibility of automating the major information processing functions pertaining to its regulatory activities. The result of this feasibility study was a proposed Regulatory Information System (RIS) which was designed to automate information (predominantly financial) reported to the FPC by regulated gas and electric utilities. FPC's announced objectives in establishing the RIS were to enhance its regulatory activities while attempting to reduce the cost of regulatory reporting. The planned redesign of the forms was an attempt to reduce redundant data items and use a centralized automated base which would provide access to information by staff personnel of the FPC and potentially by State regulatory commissions and public interest groups.

During the early development of RIS and as a result of the issuance of FPC Order 494, FPC's Office of Regulatory Information Systems held meetings with State regulatory commissions and public utilities' representatives. In the summer of 1976, these groups and others were given an additional opprotunity to comment on specific data requirements of the RIS. A series of Notices of Proposed Rulemaking (NPR) describing proposed reporting forms were published in the Federal Register.

The nature and format of the proposed forms in the NPRs generated considerable comment. While some comments were in support of the data requirements, many indicated that the industry felt that the reporting requirements would be more burdensome. Additionally, in 1976, the Commission on Federal Paperwork (CFP) reviewed RIS and, while supporting the basic concept, made major recommendations for reducing the reporting burden.

With the establishment of the Department of Energy in 1977, final implementation of RIS became a joint responsibility of the Federal Energy Regulatory Commission (FERC) and the Energy Information Administration (EIA) within the Department of Energy (DOE). Further, as a result of the President's Burden Reduction Program, FERC is re-evaluating the need for all of its data and attempting to reduce its reporting requirements wherever possible. FERC and EIA have been working on this problem jointly and the implementation of the new forms associated with RIS has not yet been completed. The passage in 1978 of the National Energy Act has also placed additional requirements on FERC and EIA in its use of data.

As new forms are designed and changes made to existing forms, it is important to coordinate Federal and State requirements for the collection and usage of similar data. In order to assist us in our evaluation of regulatory requirements and data processing requirements, we are interested in your commission's views concerning the RIS.

1. RIS was described by the Federal Power Commission as "an information system." Generally, an information system can be considered to have three major components: input (data being reported on specified forms), processing (manual or computerized filing and manipulation of data), and output (reports or other data generated for users such as Federal or State regulators or others). The forms to be used for input to RIS have not been finalized. The "generalized" computer software (instructions) to be used for processing has been considered "operational" since 1977. Output reports have not yet been fully decided upon. With which of the following aspects of RIS are you familiar? (Check all that apply.)

1.	/34/	Overall objectives of RIS	(5)
2.	/23/	Series of forms identified in the mid-1976 Notices of Proposed Rulemaking	(6)
3.	/11/	Same series of forms, as modified after 1976	(7)
4.	/ 9/	Computer software requirements	(8)
5.	/ 8/	Computer hardware requirements	(9)
6.	/22/	Anticipated outputs your State could use	(10)
7.	/ 1/	Other _____	
		_____	(11)
8.	/ 3/	No knowledge of RIS	(12)

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2. In general, has your commission supported or opposed the development of RIS? (Check one.) (13)

   1. /4/ Strongly supported
   2. /11/ Supported somewhat
   3. /21/ Neutral
   4. /5/ Opposed somewhat
   5. /__/ Strongly opposed

3. How has your commission participated in the development of RIS? (Check all that apply.)

   1. /15/ Not at all--(Skip to question 6) (14)
   2. /1/ Asked to participate but did not do so (Skip to question 6) (15)
   3. /6/ Commented on proposed rulemaking (16)
   4. /14/ Attended seminars (17)
   5. /18/ Participated in informal discussions (18)
   6. /2/ Participated in trade association task force (19)
   7. /1/ Participated in pilot tests in 1977 (20)
   8. /2/ Other _____ (21)

   1 missing

4. What impact do you believe your commission's participation will ultimately have on the development of RIS? (Check one.) (22)

   1. /__/ Major impact
   2. /2/ Moderate impact
   3. /8/ Minor impact
   4. /5/ Very minor impact
   5. /4/ No impact
   6. /5/ Too early to judge

   1 missing

5. So far, how satisfied or dissatisfied has your commission been with its participation in the development of RIS? (Check one.) (23)

   1. /__/ Very satisfied
   2. /7/ Satisfied
   3. /12/ Borderline
   4. /4/ Dissatisfied
   5. /__/ Very dissatisfied

   2 missing

6. In 1976, the Commission on Federal Paperwork caused significant changes to the RIS reporting requirements. In your opinion, did these changes increase or decrease the potential value of RIS to your commission? (Check one.) (24)

   1. /1/ Significantly increased
   2. /2/ Increased
   3. /9/ No change
   4. /1/ Decreased
   5. /4/ Significantly decreased
   6. /24/ No basis to judge

7. In terms of the potential value of RIS to your commission, how satisfied or dissatisfied were you with the results of the 1977 industry pilot tests of RIS? (Check one.) (25)

   1. /31/ Not applicable--not familiar with the pilot tests
   2. /__/ Very satisfied
   3. /3/ Satisfied
   4. /5/ Borderline
   5. /1/ Dissatisfied
   6. /__/ Very dissatisfied

   1 missing

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8. Generally, how do your commission's reporting requirements for industry compare to the FPC/FERC's reporting requirements (forms)? (Check one.) (26)

1. /5/ No basis to judge
2. /9/ Exactly the same
3. /13/ Slightly different
4. /9/ Moderately different
5. /4/ Significantly different
6. /__/ No comparison at all

1 missing

9. Which of the following specific reports are required from energy companies by your commission in essentially the same format as FPC/FERC forms? (Check all that apply.)

1. /38/ Annual Corporate and Financial Data for Electric Utilities (FPC 1) (27)
2. /27/ Annual Corporate and Financial Data for Natural Gas Pipeline Companies (FPC 2) (28)
3. /14/ Power System Statement (FPC 12) (29)
4. /5/ Total Gas Supply of Natural Gas Pipeline Companies Annual Report (FPC 15) (30)
5. /4/ Questionnaire Schedule for Continuing Review of Rate Schedules Analysis, Filed Rates, Volumes, Quality Cond. (FPC 108) (31)
6. /4/ Other (please specify) _____

2 missing (32)

10. In what media does your commission require reports from your regulated industries? (Check all that apply.)

1. /41/ Hard copy (reports) (33)
2. /3/ Computer printout (34)
3. /3/ Magnetic tapes (35)
4. /1/ Microfilm/microfiche (36)
5. /1/ Other (please specify)_____

_____

_____ (37)

11. Once RIS is fully operational (including forms, processing, and reports), in what medium would your commission prefer to receive companies' reports? (Check one.) (38)

1. /31/ Hard copy (report)
2. /3/ Computer printout
3. /8/ Magnetic tapes
4. /1/ Microfilm/microfiche
5. /1/ Other _____

2 missing

12. How do you rate the quantity, quality and timeliness of the regulatory accounting and operating information your commission is currently receiving from energy industries? (Check one box for each row.)

	1 Very good	2 Good	3 Fair (O.K.)	4 Poor	5 Very poor	
1. Quantity (comprehensiveness of cost information)	7	22	9	1		(39)
2. Quality (accuracy of cost information)	10	22	6	2		(40)
3. Timeliness	7	21	7	4	1	(41)

1 missing

13. Please provide your best estimate of the approximate annual operating costs (e.g., personnel, equipment, supplies, etc.) of your current regulatory information system. (Check one.) (42)

1. /12/ $50,000 or less
2. /6/ $50,001 - $100,000
3. /8/ $100,001 - $500,000
4. /1/ $500,001 - $1,000,000
5. /__/ Over $1,000,000
6. /14/ No basis to judge

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14. In your opinion, how do your commission's costs of your current information system compare to its benefits? (Check one.) (43)

1. /3/ Costs significantly outweigh benefits
2. /2/ Costs somewhat outweigh benefits
3. /9/ Benefits and costs about equal
4. /13/ Benefits somewhat outweigh costs
5. /10/ Benefits significantly outweigh benefits

4 missing

15. What is your current expectation regarding the extent to which your commission will probably adopt the proposed RIS? (Check one.) (44)

1. /__/ Totally
2. /8/ Major extent
3. /10/ Moderate extent
4. /4/ Minor extent
5. /3/ Little or not at all (Skip to question 23.)
6. /16/ No basis to judge

16. To what extent will the change over to RIS facilitate or hinder your commission's regulatory functions? (Check one.) (45)

1. /1/ Greatly facilitate
2. /9/ Facilitate somewhat
3. /11/ Little or no impact either way
4. /3/ Hinder somewhat
5. /2/ Greatly hinder
6. /11/ No basis to judge

4 missing

17. Please provide your best approximation of the magnitude of start-up costs (e.g. acquisition of equipment and training of personnel) your commission would incur in the changeover to RIS. (Check one.) (46)

1. /__/ $0
2. /10/ $1 - $50,000
3. /4/ $50,001 - $100,000
4. /4/ $100,001 - $500,000
5. /__/ $500,001 - $1,000,000
6. /__/ Over $1,000,000
7. /18/ No basis to judge

5 missing

18. Do you expect your commission's annual operating costs to increase, decrease, or remain about the same under RIS? (Check one.) (47)

1. /20/ Increase
2. /14/ Remain about the same (If checked, please skip to question 20.)
3. /__/ Decrease

7 missing

19. Please provide your best approximation of the magnitude of likely change in annual commission operating costs expected under RIS. (Check one.) (48)

1. /__/ $0
2. /9/ $1 - $50,000
3. /2/ $50,001 - $100,000
4. /2/ $100,001 - $500,000
5. /__/ $500,001 - $1,000,000
6. /1/ Over $1,000,000
7. /11/ No basis to judge

16 missing

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20. In terms of types of resources, what additions would you expect to be required for your commission as a result of using RIS? (Check as many as apply.)

1. /8/ None (49)
2. /18/ Additional staff (50)
3. /21/ Additional computer software (51)
4. /18/ Additional computer hardware (52)
5. /3/ Other_____ (53)

4 missing

21. How would the total costs (start-up and additional operating, if any) compare to anticipated benefits, for:

(a) Your commission? (Check one) (54)

1. /4/ Costs would probably significantly outweigh benefits
2. /5/ Costs would probably somewhat outweight benefits
3. /4/ Costs would probably about equal benefits
4. /8/ Benefits would probably somewhat outweigh costs
5. /2/ Benefits would probably significantly outweigh costs
6. /14/ No basis to judge

4 missing

(b) Regulated industries in your State? (Check one.) (55)

1. /2/ Costs would probably significantly outweigh benefits
2. /9/ Costs would probably somewhat outweigh benefits
3. /2/ Costs would probably about equal benefits
4. /4/ Benefits would probably somewhat outweigh costs
5. /1/ Benefits would probably significantly outweigh costs
6. /18/ No basis to judge

5 missing

22. In your opinion, how easy or difficult would it be for various size regulated companies in your State to supply the appropriate quality and quantity of timely information required under RIS, for

(a) Regulated electric companies? (Check one for each row.)

	1 Very easy	2 Easy	3 Borderline	4 Difficult	5 Very difficult		Missing
1. Small companies	3	1	6	9	11	(56)	11
2. Medium companies	4	6	13	5	2	(57)	11
3. Large companies	8	16	4	2	2	(58)	9

(b) Regulated gas companies? (Check one for each row.)

	1 Very easy	2 Easy	3 Borderline	4 Difficult	5 Very difficult		Missing
1. Small companies	3	1	3	12	11	(59)	13
2. Medium companies	3	6	10	5	2	(60)	14
3. Large companies	6	14	6	1	2	(61)	12

23. Please provide your best estimate of the aggregate annual cost for the regulated energy industries to report on two different formats (Federal and State). (Check one.) (62)

1. /5/ Not applicable--State does not plan to continue using old forms
2. / / $0 - $10,000
3. /3/ $10,001 - $100,000
4. /2/ $100,001 - $1,000,000
5. /2/ $1,000,0001 - $5,000,000
6. / / $5,000,001 - $25,000,000
7. / / Over $25,000,000
8. /27/ No basis to judge

2 missing

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24. **Please provide any comments as to the advantages and disadvantages regarding the development of RIS in the space below. Use additional space as necessary.** (63-69)

25. **Please provide below the name(s), title(s), phone number(s), and State of the individual(s) responding for your State.** (70)

_____
Name

_____
Title

_____
Telephone Number

_____
State

APPENDIX III

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON 20426

JAN 7 1981

Mr. J. Dexter Peach
Director, Energy and Minerals
Division
General Accounting Office
Washington, DC 20548

Dear Mr. Peach:

Thank you for your letter of December 19, 1980, transmitting the draft GAO report entitled "Millions Wasted Trying to Develop Major Energy Information System: Can It Happen Again?"

The Federal Energy Regulatory Commission does not have any substantive comments on this report other than some minor editorial suggestions noted on the enclosed markup. As you know, the responsibility for the development of the Regulatory Information System was transferred to the Energy Information Administration (EIA) in 1977 under the provisions of the DOE Organization Act. Therefore, the Commission cannot render an opinion on the conclusions and recommendations in the report, since these recommendations are beyond the purview of this Commission.

Recognizing that the Administrator of EIA is the cognizant authority regarding the Regulatory Information System, the accuracy of the facts as presented in this draft report should be confirmed or denied by EIA. Naturally, the Commission will cooperate in any program designed to implement the final recommendations of this report.

Sincerely,

Georgiana Sheldon
Acting Chairman

Enclosure

Department of Energy
Washington, D.C. 20585

JAN . . 1981

Mr. J. Dexter Peach
Director, Energy and Minerals
Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

We appreciate the opportunity to review and comment on the draft of a proposed report: Millions Wasted Trying to Develop a Major Energy Information System: Can It Happen Again?, prepared by the staff of the U.S. General Accounting Office (GAO). Although we share GAO's concern over certain aspects of the development of the Respondent (formerly Regulatory) Information System (RIS), we strongly disagree with the conclusions and recommendations of the draft report. Furthermore, we must take exception to its needless sensationalistic character, evidenced by the title, and also to the many erroneous inferences in the body of the draft report.

GAO response:

The report title was not intended to be sensationalistic, but it has been slightly revised. DOE generalizes that the report contains "many erroneous inferences," but challenges few specific facts in the report.

The draft report completely ignores facts underlying the Energy Information Administration's (EIA) management actions to solve the problems associated with RIS and erroneously asserts that EIA did not work on solutions. The draft report concludes that current EIA systems development work is suspect because of the difficulties arising out of the RIS effort. Such a conclusion contradicts the GAO's own acknowledgment that the EIA played no role in the initial design and development of the RIS. When the system was inherited by DOE, its design and development deficiencies had been over 7 years in the making. Such a conclusion wrongly intimates that ongoing EIA systems development projects are thereby tainted by the RIS experience. Those major new systems designed and developed by the EIA cannot be compared to the RIS development. It is important to note that, during GAO's exit conference, EIA cautioned the investigators against this incorrect line of reasoning. Yet, it appears in the draft report forcefully.

GAO response:

We recognize that Regulatory Information System development was initiated and continued by the Federal Power Commission for many years during which time the bulk of RIS developmental costs were incurred. Our report distinguishes between the roles of the Federal Power Commission and EIA in the history of RIS. EIA did continue RIS development for an additional 2 years after it inherited primary system development responsibility. We believe EIA's management actions during those 2 years should have been more effective and timely. This report discusses two systems other than RIS being developed during the same time period because some problems associated with those two systems were similar to those associated with RIS.

This "guilt by association" tactic is unfair and disingenuous, especially when one considers that only one system, the RIS, was being studied. EIA strongly objects.

GAO response:

Problems in developing the Financial Reporting System and the National Energy Information System were discussed in recent published reports by GAO and by the Professional Audit Review Team. As noted in our response to points 7, 8, and 9 below, additional material on EIA's position and views regarding those two systems have been incorporated into the report.

The recommendation that the Administrator, EIA, formally document and communicate plans for future use of RIS is a moot point. EIA does not plan on any future use of RIS.

The recommendation that the Administrator, EIA, provide guidance for reviewing the development of current and future information systems is inapplicable. The EIA has in place a very clear and comprehensive set of standards and operating procedures to which every systems development effort must conform.

Additional detailed comments follow and we hope they will be of use to you as the final report is prepared. 1/

1. Cover page: "Millions Wasted Trying to Develop a Major Energy Information System: Can It Happen Again?".

   DOE Comment: The draft report, as illustrated by the wording of the title, is based upon sensationalism rather than upon concrete facts. The title should be changed, as should much of the inflammatory language in the draft report.

1/Page nos. have been changed to correspond to p. nos. in final report.

GAO response:

The draft is based upon facts carefully documented and verified during our review. The facts were discussed in detail at exit conferences with responsible high level officials of both the Energy Information Administration and the Federal Regulatory Commission, at which time there were no significant challenges to their accuracy.

Although DOE generalizes that the report is not based on "concrete facts," it does not point to specific facts with which it disagrees. Rather than challenge facts, DOE's comments on our report fell mainly into the following categories:

—Concern with the overall tone of the report.

—A desire to clearly recognize that the Federal Power Commission initiated RIS and spent more time and money on it than EIA.

—A desire to better recognize some of EIA's current management practices.

—Disagreement with GAO's conclusions and recommendations.

Based on DOE's concerns, the draft report was carefully reviewed and revised as we considered appropriate.

2. Pages 4, 26, and 27: The draft report states that EIA invested further time and money in developing RIS, and that the EIA unsuccessfully used the system for other than the originally planned functions.

DOE Comment

Of course EIA invested further time and money. This statement omits the fact that the DOE Act caused EIA to inherit from the Federal Power Commission (FPC) certain functions including existing contracts, staff, and budgeted funds devoted to the development of RIS. Section 205 of the DOE Act requires EIA to carry out a central energy data and information program for the Department. In addition, the EIA is subject to carrying out orders issued by the Federal Energy Regulatory Commission (FERC) to fulfill its data needs. To have summarily halted the RIS effort at that point would have been irresponsible, despite the system's suspected deficiencies. Development continued, specific problems were noted and verified, user needs were reviewed, the RIS was tested on various applications, (the fact that all four of the EIA attempts to use the RIS software were unsuccessful further reassured both EIA and FERC

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management that RIS was indeed not a viable system) and, in cooperation with the FERC, the system was cancelled.

GAO response:

The material presented by DOE was considered during our review. In fact, DOE does not present any information which is inconsistent with our draft report. We did not suggest that EIA should have "summarily halted" the RIS effort. However, when EIA assumed responsibility for RIS it was aware that RIS had problems. Continuing the RIS development for another 2 years without resolving the problems was highly questionable in our opinion. EIA should have given a high priority to studying the viability of RIS.

3. Page 27: The draft report asserts that the Administration did not establish a procedure to carefully track the progress of RIS and all associated costs.

DOE Comment

The EIA has had a Resource Accountability System which monitors cost and has been in place since 1976 when it was established by the Federal Energy Administration. In April 1978, the EIA established a Project Accountability System and also monitored major projects through the Secretary's Action Coordination and Tracking System (ACTS). RIS was monitored through each of these systems, as are major systems development efforts. In addition, RIS progress was monitored by both EIA and the FERC top management through biweekly status reviews and an ongoing monthly system of Project Evaluation Review Technique (PERT) status reports.

GAO response:

We did not consider the procedures to be fully effective in tracking RIS progress and costs. We have incorporated comments in the report on the tracking procedures to which DOE refers. (See pp. 37-38.)

4. Pages 29 and 34: The draft report alleges that top management of the EIA took actions which appear to be contradictory, and that EIA top management assigned relatively low priority to getting the system operational.

DOE Comment

These allegations were made without GAO staff ever having any discussion or interviews, either by phone or in person, with EIA top management. During the 11 months that the GAO staff performed its review, EIA top management was visited by the GAO staff once for its entrance meeting in January 1980 and again in December 1980 for the GAO exit conference. At no other time during the 11-month study did any GAO staff interview either the top EIA management or the senior management official who was responsible for over 6 years of RIS development.

GAO response:

During preliminary survey work on the status of RIS in 1979, we held extensive discussions with the senior management official (RIS project manager) who was responsible for over 6 years of RIS development. When beginning the detailed review in January 1980, we met with the Assistant Administrator and his Deputy, to whom the RIS project manager reported. During the review, we held numerous discussions with many high level EIA officials associated with the RIS effort during its lengthy history.

While we held discussions with all appropriate high level EIA officials to the extent we considered necessary, there is a more important point. The GAO report is substantiated primarily by documentary evidence--including numerous RIS-related reports, records and memorandums prepared by the former RIS project manager and other Federal and non-Federal officials.

DOE Comment:

Top EIA management began noting the problems associated with RIS in October 1977 when the EIA was directed to assume responsibility of data gathering for the FERC.

EIA top management did deal with the problems of RIS. In April 1978, in conjunction with the FERC, the EIA Assistant Administrator for Energy Data initiated a requirement for element-by-element justification of all proposed reporting requirements, including those requirements of RIS.

Through this process it became apparent that much of the FPC justification for RIS was no longer valid and much of the data was not needed by the FERC.

Through a series of project reviews and unsuccessful attempts by the RIS project team to demonstrate the system, top management became concerned with the apparent problems associated with operating the RIS.

In August 1978, the Assistant Administrator for Energy Data then initiated three consultant studies to obtain independent assessments of the system's viability.

When the key architects of the system left the Federal service, technical development was naturally hampered. EIA management was concerned with the loss of RIS knowledgeable staff and took action to train personnel.

The allegation that EIA top management assigned relatively low priority to getting the system operational is not factually based. RIS was managed by a senior government official and supported with an appropriate level of resources.

Because the RIS was being developed under the sponsorship of the FERC, EIA could not prematurely stop development until the FERC cancelled its sponsorship. In September 1979, the FERC cancelled its sponsorship when the Commission's revalidation program determined that massive changes to the data elements collected would be required. At this point EIA cancelled further RIS development.

GAO response:

The DOE historical account of EIA management of the RIS effort between October 1977 and September 1979 is generally accurate, but it is incomplete and misleading on some key points. We believe EIA's actions to resolve known and longstanding problems with RIS were too slow in coming. The actions DOE cites do not indicate that EIA was effectively managing the RIS effort.

When EIA assumed responsibility for RIS in October 1977, the Commission on Federal Paperwork had already identified some problems with RIS. In December 1976, as part of the paperwork commission's investigation, an official of the Federal Energy Administration presented a statement criticizing proposed RIS requirements. That same official later became responsible for

managing RIS. His earlier involvement in the paperwork commission's study alerted him from the start of EIA's involvement that RIS had problems. Because RIS was to be a major EIA system, we believe his earlier awareness of problems should have caused this official to assign high priority to resolving the problems.

We do not view the element-by-element justification as a true indication of how well EIA dealt with RIS problems. The element-by-element justification was carried out pursuant to a Presidential Executive order issued in March 1978--and was not solely an EIA initiative to better manage RIS. More importantly, while EIA did cooperate with the Federal Energy Regulatory Commission, it was the Commission which took the first action regarding validation of RIS data requirements.

We do not view the consultant studies to be an indication that EIA's top management was dealing with the problems of RIS. EIA did not prepare a formal justification or rationale for initiating three consultant studies to obtain independent assessments of the system's viability. Therefore, it was not clear why three studies were required. Even more significant, the consultant's recommendations seemed to be ignored--they were neither implemented nor documented as having been considered by EIA's top management.

In view of the complexity of the RIS software, we believe the training sessions to which DOE refers could hardly be considered substantive. DOE asserts that, when the key architects of the system left Federal service, EIA management took action to "train personnel." We had not identified any substantive RIS training programs during our review. We were advised that the DOE reference was to a 2-week training session given to two individuals in May 1978 in regard to the proposed use of RIS software on the Financial Reporting System.

We recognize EIA could not reasonably have been expected to stop development without FERC involvement. In fact, at times it was FERC asking EIA to take action on RIS--rather than EIA apprising FERC of problems. FERC withdrew its support of the system in June 1979--not September 1979--and did not cancel actions on the proposed reporting forms until April 1980.

5. Page 31: The draft report alleges that rather than expeditiously resolving problems already identified, EIA contracted with three separate consultants to further study the system's usefulness.

DOE Comment

This is an allegation not based upon fact. EIA, by commissioning the studies, wanted to obtain views independent of the factions involved in the many years of RIS development. EIA was, at the same time, also working closely with the FERC to resolve the organizational disputes which had built up over these years. Indeed, the draft report characterizes this situation as "a very hostile environment" (page 33).

GAO response:

The consultant studies did not achieve recognizable results, but instead became a reiteration of many problems that were already known. As stated in regard to point 4, EIA did not document its rationale for commissioning the consultant studies of the Regulatory Information System and when the consultants' recommendations were received, EIA did not act upon them.

6. Page 35: The draft report asserts that deliberate actions were taken to reassign knowledgeable personnel away from the system.

DOE Comment

This entire allegation is totally false.

GAO response:

This point has been dropped from the report because the number of personnel reassignments was very small. However, the more important point—that EIA did allow the number of personnel familiar with RIS to dwindle without replacement—remains.

7. Pages 39-40: In the draft report, six major new EIA systems are identified. Two of these systems are linked to the RIS as potentially suffering from some of the same deficiencies, and a clear implication is made that the others are faulty as well.

DOE Comment

Linking the Financial Reporting System (FRS) and the National Energy Information System (NEIS) to the RIS is a gross misrepresentation of the facts on the part of the GAO. The NEIS is mandated by Section 52 of the Federal Energy Administration Act and the FRS is required by Section 205(h) of the DOE Act. The draft report fails to recognize that these statutes specify many of

the requirements which EIA must fulfill in developing these systems. The report fails to point out that the FRS is producing much needed information on the financial structure of the energy industry and that the problems identified in past GAO reports on FRS have been resolved by the EIA. In addition, while the NEIS is being developed slowly, it has begun to produce valuable products and NEIS associated costs are but a small fraction compared to the cost of the RIS development.

Further, the NEIS is a conceptual framework for analyzing and integrating systems. It will not be a large body of software for processing incoming data. The remaining four systems identified by the GAO are major new EIA efforts which are not, nor can they be, associated in any way with RIS-type problems. Including these major new efforts in the report implies a "guilt by association" which is in no way applicable to these EIA programs.

GAO response:

A major EIA function is managing the development of energy information systems. EIA needs to be continually aware of any areas of possible improvement in how it manages these important efforts. We believe the problems with RIS, coupled with the matters discussed in chapter 4, indicate that an EIA review of its management practices would be a reasonable step. The report has been revised to incorporate DOE's views regarding EIA's position on the two other major systems that were recently criticized in other reports. (See pp. 44-45.) (Reference to six major systems has been deleted.)

8. Page 40, paragraph 1: Criticism is directed at EIA's efforts in developing and operating the FRS.

DOE Comment

The draft report makes no reference to EIA's responsiveness to what, up to now, have been constructive and useful criticisms in past GAO reports. Further, it fails to consider that a key past GAO recommendation, i.e., that OMB withhold clearance of the FRS reporting form, was found by OMB to be unnecessary after they conducted an independent review. It omits the fact that two reports have been issued by the FRS using its data base developed via the FRS reporting form (EIA-28). The GAO staff should also note that the November 1980 Professional Audit Review Team (PART) report expresses a favorable position regarding EIA's development of the FRS.

GAO response:

The current status of the Financial Reporting System has been added to the report. (See p. 40.)

9. Page 40, paragraph 5: The draft report alleges that the developers of the NEIS had not solicited the formal views of the system's intended users.

DOE Comment

As was mentioned in the response to the 1980 PART report, EIA has actively solicited input from potential users of NEIS data, both formally and informally, with regard to their data needs. The selection of EIA data for the initial version of the NEIS was based in part on whether there was a demonstrable need for the data based on actual use. The NEIS concepts paper was printed and distributed in December 1980. EIA is now coordinating a more formal requirements analysis that will synthesize and expand upon the NEIS concept.

GAO response:

Additional information on EIA's views of obtaining input from potential users of the National Energy Information System have been incorporated into the report. The Professional Audit Review Team did not consider EIA's actions adequate. (See pp. 40-41.)

10. Page 42: The draft report concludes that the RIS experience should serve as a catalyst to the EIA to re-evaluate its system management approaches.

DOE Comment

The EIA has in place a very clear and comprehensive set of standards and operating procedures. Every effort is made to assure that new data collection efforts and systems rigorously conform to these standards. For EIA data collection efforts:

- User needs are determined.
- System requirements are analyzed, documented, and approved.
- Data collection must be justified on an element-by-element basis.
- System concepts, design, and specifications are documented before development is begun.

- Computer programs are developed in accordance with rigid guidelines and standard languages.

- Production operation is not begun until systems have passed acceptance testing.

Throughout the life cycle of system development, management oversight is conducted through formal reviews.

- A Procurement Review Board reviews all EIA contracts before they are awarded.

- A Data Requirements Review Board reviews all major data collection efforts and complex data issues.

- A Project Accountability System is used to monitor schedules and milestones.

- Peer review and outside expertise is obtained for selected systems through frequent participation with the American Statistical Association Ad Hoc Committee on Energy Statistics.

- In addition, EIA is subject to the Office of Management and Budget's (OMB) Information Collection Budget process. Through this process OMB assures that data users follow strict disciplines of minimizing Federal reporting burden, and thoroughly justifying all data collection programs.

GAO response:

We have incorporated material into the report to discuss and assess the above formal reviews. Although these reviews may be useful, they will not necessarily prevent recurrence of some types of problems encountered during the RIS development effort. (See p. 39.)

11. Page 47: Page 47 contains a table entry summarizing the use of RIS by the FRS.

DOE Comment

The table entry is an inadequate description of the use of RIS by FRS. In fact, RIS produced final edit reports corresponding to each of 40 separate schedules in the

FRS. The edit reports included over 3,500 mathematical checks. No problems were experienced with respect to data integrity. Use of RIS by the FRS for data editing was discontinued because of plans to introduce modified forms for reporting year 1979, and because further in-house support to RIS was being terminated. The replacement software was able to use, intact, the edit criteria developed for input to RIS and the edit output report formats.

GAO response:

The table is intended to present an overall picture of RIS results. During our review and at the exit conference with EIA, we discussed specifically how the use of RIS by the Financial Reporting System would be presented, at which time EIA officials agreed that the presentation was fair. DOE questions the adequacy rather than the accuracy of the table entry on the Financial Reporting System; we have included reference in the table to the additional information on the Financial Reporting System provided by DOE in its comments. This additional information does not alter the overall picture presented by the table--namely that RIS produced minuscule results.

12. The draft report concludes that the Survey of State Regulatory Commissions, referenced in Appendix II, supports a need for further State coordination of RIS activities.

DOE Comment

The GAO survey, in general, is an opinion poll. Most of the responses fall in the neutral, borderline, midrange, and "no basis to judge" categories. An opinion survey is not supportive of factual conclusions about the need for or acceptability of State participation.

GAO response:

As with many questionnaires, questions addressed both facts and opinions. Because the development of RIS was continued partially based on States' anticipated involvement, in our opinion adequate State participation in its development was essential. We relied on facts gathered in personal and telephone contacts with State regulators, and from written records--as well as the questionnaire results--in reaching our conclusion that State participation had been inadequate.

APPENDIX IV

The usefulness of publishing this report, as currently written, is questionable--the agency primarily responsible for the development of RIS, the FPC, no longer exists. EIA can only be assigned a very small portion of the RIS costs, specifically those costs devoted to evaluations, testing, and ultimately, the closing down of the system. If this report is finalized, it must carefully and accurately document the responsibilities of the FPC and the EIA. It must further confine itself to the single issue of RIS, thereby avoiding groundless inferences about the quality of EIA-developed systems.

Sincerely,

P. Marshall Ryan,
Controller

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