PROFESSIONAL AUDIT REVIEW TEAM

REPORT TO THE PRESIDENT
AND THE CONGRESS

PERFORMANCE EVALUATION OF THE ENERGY INFORMATION ADMINISTRATION

DEPARTMENT OF ENERGY

JULY 1988

PART-88-1

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To the President of the United States, the President of the Senate, and the Speaker of the House of Representatives

This report discusses the results of the Professional Audit Review Team (PART) evaluation of the Energy Information Administration's (EIA) performance, as required by the Department of Energy Organization Act (Public Law 95-91, August 4, 1977). The report covers EIA's activities during the period October 1985 through June 1987.

Copies of this report are being sent to the Secretary of Energy, the Director of the Office of Management and Budget, the chairmen of energy-related congressional committees, and the heads of the PART member agencies.

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General Accounting Office

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EXECUTIVE SUMMARY

PURPOSE

The energy crisis of the 1970s increased awareness of the need for comprehensive energy information programs. To meet this need, the Energy Information Administration (EIA) was established to develop and maintain information for national energy policy decisions.

The Congress created the Professional Audit Review Team (PART)—composed of members from leading federal statistical and analytical agencies—to evaluate periodically whether EIA performed its activities independently, objectively, and professionally. PART is reporting on its evaluation for the period October 1985 through June 1987. The principal objective of this review was to evaluate the adequacy of programs for assuring the Administrator of the quality of EIA's data collection and analysis systems.

BACKGROUND

The Department of Energy Organization Act established EIA as the federal focal point to collect, process, and publish data and information relevant to energy resource reserves, production, demand, and technology. The act also recognized the need to ensure that energy data collection and analysis functions are not biased by political considerations or energy policy formulation and advocacy activities.

Among the principal parts of EIA's quality programs covered in this review are

- the quality maintenance portion of the quality control activities of the three program offices to implement quality policy, standards, and methods; establish process control procedures; and constrain product variability;
- quality audits which evaluate the effectiveness of quality control programs; and
- model and data system documentation and its compliance with applicable standards.

The review also updates EIA's progress in strengthening procedures to protect and preserve EIA's independent status.

RESULTS IN BRIEF

Concerning quality activities, PART found that EIA

- does not have sufficient assurance that its quality control is adequate,
- needs to consider the relative importance of each data form and the stability and reliability of the underlying database in setting priorities for quality audits for data collection forms to assure focus on the highest quality maintenance priorities, and
- has made substantial progress in documenting its models and data systems and now needs to turn its attention to examining the adequacy of the documentation.

PRINCIPAL FINDINGS

QUALITY CONTROL OVERSIGHT

The relative share of the EIA budget devoted to quality maintenance investments has dropped significantly from fiscal years 1983–87, and the program continues to be tailored to the budget levels rather than the reverse. For example, EIA accounting data indicated a reduction in the quality contract budget of 25 percent from 1986–88.

The need to assess the level of quality control to determine whether it is adequate is underscored by (1) the 8-year cycle for quality audits, (2) the fact that at the close of fiscal year 1986 about half the forms in use had never been audited, and (3) an EIA study that concluded that delayed quality control at least doubles the cost of quality maintenance where it can be measured.

PART continues to believe that EIA needs to determine what scope and frequency of quality activities constitutes an adequate program. If EIA determines that, because of other priorities it cannot fund what it has determined to be an adequate quality

program, it should disclose in its affected published reports any limitations of the underlying data.

QUALITY AUDITS

As a result of budget reductions in the early 1980s, EIA shifted from a comprehensive quality program of validation studies in a 5-year cycle to a more modest program of quality audits in an 8–year cycle. As of June 30, 1987, almost half of the forms that EIA used to gather and analyze data had never been analyzed by either program. Beginning with the fiscal year 1988 budget, EIA provided funds for 11 audits per year, putting them on a 5-year cycle.

EIA developed a tentative schedule for performing quality audits, using two factors to set priorities for each form—cost to the government and cost (measured by burden to respondents) to the public. PART believes that factors relating to the overall importance of the data and knowledge on its reliability and stability should also be considered.

EIA's quality audits make recommendations for improvements; however, EIA had no formal system to assure their implementation. In 1986 EIA made a onetime followup of recommendations in seven quality audits that had been issued from 1½ to 2½ years prior to the followup. Half of the recommendations had been fully implemented, but the others were either not implemented, partially implemented, or in the process of being implemented.

ACTION ON QUALITY PROBLEMS

PART's reports over 10 years concluded that EIA does not have sufficient assurance that its quality control is adequate. PART believes that EIA's actions on PART's recommendations in the quality area have been slow and limited. PART believes that EIA must take more timely action on the quality issues that PART has raised.

DOCUMENTATION

EIA is required to have available adequate documentation for statistical or forecast reports at the time they are published. Documentation includes a description of a model or data collection system. It provides a basis for evaluating the quality of the data and analyses by verifying claims for model or system capabilities as well as assessing support for model applications.

EIA has continued to increase the number of models and data systems that have the documentation required by EIA standards. As EIA completes the required documentation, PART recommends that EIA now turn its attention to examining the adequacy of that documentation to be assured of its reliability and completeness.

RECOMMENDATIONS

To improve EIA's operations, PART makes several recommendations to the Administrator. Among the principal areas covered are (1) assessing the adequacy of quality control activities, (2) considering added factors in prioritizing quality audits, and (3) evaluating the adequacy of documentation. (See chs. 2 and 3.)

AGENCY COMMENTS

PART obtained official comments from EIA on this report (see app. II). The comments were lengthy and critical, with EIA maintaining that it found serious problems in PART's interpretation and representation of facts.

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CHAPTER 4

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ABBREVIATIONS

ARRIS	Activities, Resources, and Results Information System
CNEAF	Office of Coal, Nuclear, Electric and Alternative Fuels
DOE	Department of Energy
EIA	Energy Information Administration
EMEU	Office of Energy Markets and End Use
O&G	Office of Oil and Gas
OPR	Office of Planning and Resources
OSS	Office of Statistical Standards
PART	Professional Audit Review Team

INTRODUCTION

Energy crises during the 1970s increased the nation's awareness of its energy problems and the need for adequate information to formulate and develop energy policies and programs. In 1976, 23 executive departments and independent agencies operated 238 major energy data gathering programs.

In 1977, legislation made the Energy Information Administration (EIA) the federal focal point for developing and maintaining comprehensive energy information programs.[1] EIA was given responsibility for information systems previously managed by the Federal Power Commission, the Bureau of Mines, and the Federal Energy Administration. EIA was also given the responsibilities of its predecessor, the Federal Energy Administration's Office of Energy Information and Analysis, which included carrying out a unified program to collect, process, and publish data and information relevant to energy resource reserves, production, demand, and technology.

The legislation specified that EIA be organized as a separate entity within the Department of Energy (DOE), separated from DOE's role in formulating and advocating national energy policy. EIA was to be headed by a professionally qualified administrator appointed by the President with the advice and consent of the Senate. In specifying the character of EIA and in describing some of the statistical and forecasting capabilities and reports it desired, the Congress attempted to create an organization capable of providing credible energy data and analysis necessary for sound decisions on national energy policy.

EIA'S ORGANIZATIONAL STRUCTURE

Three program offices—Oil and Gas; Coal, Nuclear, Electric and Alternative Fuels; and Energy Markets and End Use—are responsible for collecting, producing, and analyzing information on major fuel areas. (See organization chart in app. I for principal components of EIA.) The data provided by these offices are published in statistical periodicals, special studies, and analysis reports.

The Office of Oil and Gas (O&G) collects, processes, and interprets data about crude oil, petroleum products, natural gas, and natural gas liquids. O&G also analyzes and projects the level and distribution of petroleum and natural gas reserves and production.

The Office of Coal, Nuclear, Electric and Alternative Fuels (CNEAF) gathers and integrates data on coal, nuclear energy, electric power, and alternative fuels. CNEAF also develops projections of supply and demand for the fuels.

The Office of Energy Markets and End Use (EMEU) develops and operates EIA's statistical and forecasting information systems on energy consumption and supply. EMEU collects and processes data on energy consumption, supply and demand balances, prices, and economic and financial matters. It also prepares and publishes reviews of foreign energy developments that could affect the nation's economy.

Five nonprogram offices provide support services for EIA. The Office of Statistical Standards (OSS) provides EIA with strategies for survey and statistical design and monitors quality control for information collection, analysis, and forecasting. OSS manages the clearance process of energy data forms for public use. It also monitors and assesses the quality and meaningfulness of energy information and the process used to collect, analyze, and forecast information. OSS provides periodic reports on quality control activities throughout EIA.

The Office of Planning and Resources (OPR) manages EIA's program planning, evaluation, project control, budgeting, procurement, personnel, and legislative support services.[2] The ADP Services Staff provides computer-processing support for DOE's energy information programs, including those of EIA and the Federal Energy Regulatory Commission.

The National Energy Information Center edits manuscripts and prepares graphics for EIA publications and distributes all EIA products.[2] The center also responds to public inquiries. The Systems Integration Staff provides direction for the integration of major energy information and modeling systems and coordinates these systems with ongoing EIA activities and needs.

TRANSITION IN ENERGY INFORMATION PROGRAMS

Since fiscal year 1982, EIA has had to adjust to fluctuations in its available funding and staffing levels. From 1978 to 1980, EIA's funding level had almost doubled from about $49 million to about $91 million. However, by 1982 funding had decreased to about $71 million and from fiscal years 1984 to 1987 it ranged between $57 million and $61 million. At the close of 1978, EIA had 744 full-time permanent staff, and by 1980 staff had increased to 906. In 1983, EIA had 480 full-time equivalents (yearly staff average), and by fiscal year 1986 this had decreased to 428 full-time equivalents.

ROLE OF THE PROFESSIONAL AUDIT REVIEW TEAM

In the DOE Organization Act, the Congress mandated that the Professional Audit Review Team (PART) make an annual review and evaluation of EIA's work and determine whether data collection and analytical activities are being performed

1. The Department of Energy Organization Act (42 U.S.C. 7101).

2. Effective May 24, 1987, the National Energy Information Center and the Office of Planning and Resources were combined under one office—the Office of Planning, Management, and Information Services.

in an objective and professional manner consistent with the intent of the Congress.

This is the sixth report that PART has issued since its initial report in 1977.[3] This report is intended for the use of the President of the United States and the Congress in obtaining a current perspective on EIA's operation and its overall performance.

In accordance with the authorizing legislation, PART consists of a chairman, designated by the Comptroller General of the United States, and members drawn from the following federal agencies:

- Bureau of the Census,
- Bureau of Labor Statistics,
- Council of Economic Advisers,
- Federal Trade Commission, and
- Securities and Exchange Commission.

Over the past several months PART has lost three members—Barbara A. Bailar from the Bureau of the Census, Charles W. Bryson from the Securities and Exchange Commission, and Lorenzo Brown from the Federal Trade Commission. The first two retired from federal service and the latter accepted a position at another federal agency. However, the three former members participated in all aspects of the review and report preparation. At the completion of this report, the Bureau of the Census and Securities and Exchange Commission positions were vacant.

PART staff members during the period covered by this report and their agency affiliations were

- Mr. David D. Cahalen, General Accounting Office
- Mr. James R. Callis, Jr., General Accounting Office
- Ms. Martha Mister, General Accounting Office

3. PART, *Activities of the Office of Energy Information and Analysis*, Dec. 5, 1977.

OBJECTIVES, SCOPE, AND METHODOLOGY

The Congress has demonstrated its concern about the quality and credibility of energy information not only by establishing EIA as a separate agency within DOE, but also by creating PART to conduct an annual evaluation of EIA's operations. In planning its evaluations, PART has identified the following broad areas of concern:

- The effectiveness of EIA's programs to ensure the quality of its data collection and analysis systems.
- The effectiveness of planning and management processes.
- The relevance and usefulness of energy information programs.
- The independence from policy formulation and advocacy functions.

PART's current review concentrated on the adequacy of programs for assuring the Administrator of the quality of EIA's data collection and analysis systems. We also evaluated EIA's actions taken to implement the recommendations in PART's 1986 report and assessed the effectiveness of EIA's actions on certain prior PART recommendations.

In performing our work, we examined laws establishing and affecting EIA, EIA's policies and procedures, budget documents, reports, records, and other documents relating to the areas being evaluated. We also interviewed EIA's officials responsible for program planning, quality maintenance investments, quality audits, and other areas affected by our prior recommendations.

This report covers EIA's activities during the period October 1985 through June 1987. Our work was carried out at EIA headquarters in Washington, D.C., and was performed in accordance with generally accepted government auditing standards.

We obtained official comments from EIA on this report (see app. II). EIA's comments were lengthy and critical, with EIA maintaining that it found serious problems in PART's interpretaion and representation of facts related to EIA's quality program. We noted several instances where EIA attributed broader implications and applicability to our findings, conclusions, and recommendations than indicated by our scope. We have added language to clarify further our purposes and intent.

EIA's comments and PART's evaluation are discussed at the end of each chapter and in appendix II.

IMPROVEMENTS NEEDED IN QUALITY CONTROL ASSURANCE AND AUDIT ACTIVITIES

Since its establishment, EIA has recognized the importance of ensuring the quality of its data collection and analysis systems; however, our prior reports noted that EIA's progress in determining the accuracy and reliability of its energy information was not adequate. Further, as a result of budget reductions in recent years, the focus of EIA's quality activities was changed. Concerning two of the primary EIA quality maintenance functions—quality maintenance investments and quality audits—our last report stated that EIA

- needed to assess the adequacy of quality maintenance activities, determine the appropriate scope and frequency of audit, and seek the staffing and resources needed to carry out the program; and
- had not established a systematic plan for carrying out quality audits, and therefore did not have a basis for making adequate judgments on the quality of its data.[1]

In our current review, we found that EIA had not taken adequate action on the recommendations in these two areas.

DESCRIPTION OF EIA'S ACTIVITIES TO ENSURE THE QUALITY OF ITS DATA COLLECTION AND ANALYSIS

EIA has established several activities to ensure the quality of its data collection and analysis systems. Quality maintenance is a term used by EIA to cover its two quality areas—quality assurance and quality control (see fig. 2.1).

QUALITY ASSURANCE

EIA organizes quality assurance into the following five principal areas:

- Applied statistical methods consist of the development of statistical techniques and software to avoid disclosure, techniques for producing new sample frames, estimation and imputation techniques, and standard error calculation techniques.
- Policy and standards setting is the formulation and promulgation of written statements of quality objectives for quality assurance or quality control.
- Quality audits evaluate the effectiveness of quality control programs.
- Pre-release product reviews are examinations by outside experts to clear or certify that a product meets technical criteria and product specifications.
- Quality evaluations include state-of-the-data reports, user responses, American Statistical Association assessments, and symposia proceedings.

All of the above are the responsibility of OSS.

QUALITY CONTROL

Quality control consists of performing activities to (1) implement quality assurance policy, standards, and methods; (2) establish process control procedures and product quality specifications; and (3) constrain product variability to achieve those specifications. Quality control is carried out by the three program offices.

Quality control in the program offices consists primarily of (1) activities performed as an integral part of day-to-day operations and (2) specific projects funded as quality maintenance investments and normally done by contractors under supervision of the program offices.

PRIOR PART FINDINGS ON EIA'S QUALITY MAINTENANCE PROGRAMS

One of the principal reasons for the establishment of EIA was that the Congress lacked confidence in existing federal energy data and analyses. An important aspect of EIA's work is its data quality programs. PART has issued six reports between 1977 and 1986 and has commented on, among other things, EIA's efforts in the quality area. The following summarizes PART's findings over the years on EIA's quality programs:

- In 1977 we reported that little progress had been made in verifying data collected and analyzed.[2]
- In 1979 we reported that little had been accomplished in the way of improving the accuracy, reliability, and overall credibility of energy information.[3]
- In 1980 we reported that EIA needed to establish priorities for its eight quality tasks and a more realistic time frame for completing its planned program of validation studies. We also noted only limited results from validation studies to date.[4]
- In 1982 we reported little progress had been made toward completing validation studies, and planned efforts were scaled back due to budget cuts.[5]
- In 1984 we reported that EIA acknowledged that deterioration of the quality of information could be expected because of budget cuts but that EIA believed that its information was of high quality and therefore was reliable. PART believed that adequate assessments had not been done for EIA to make this judgment and that he quality of much of EIA's data remained uncertain.[6]
- In 1986 we reported that although EIA had made progress in implementing our recommendations, further progress was needed to provide an adequate basis for evaluating the overall quality level of EIA's data and analysis products. We reported that the number and frequency of quality audits were determined by staffing consid-

1. PART, *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, pp. 16, 17, 23 and 24.

2. PART, *Activities of the Office of Energy Information and Analysis*, Dec. 5, 1977, p. 23.

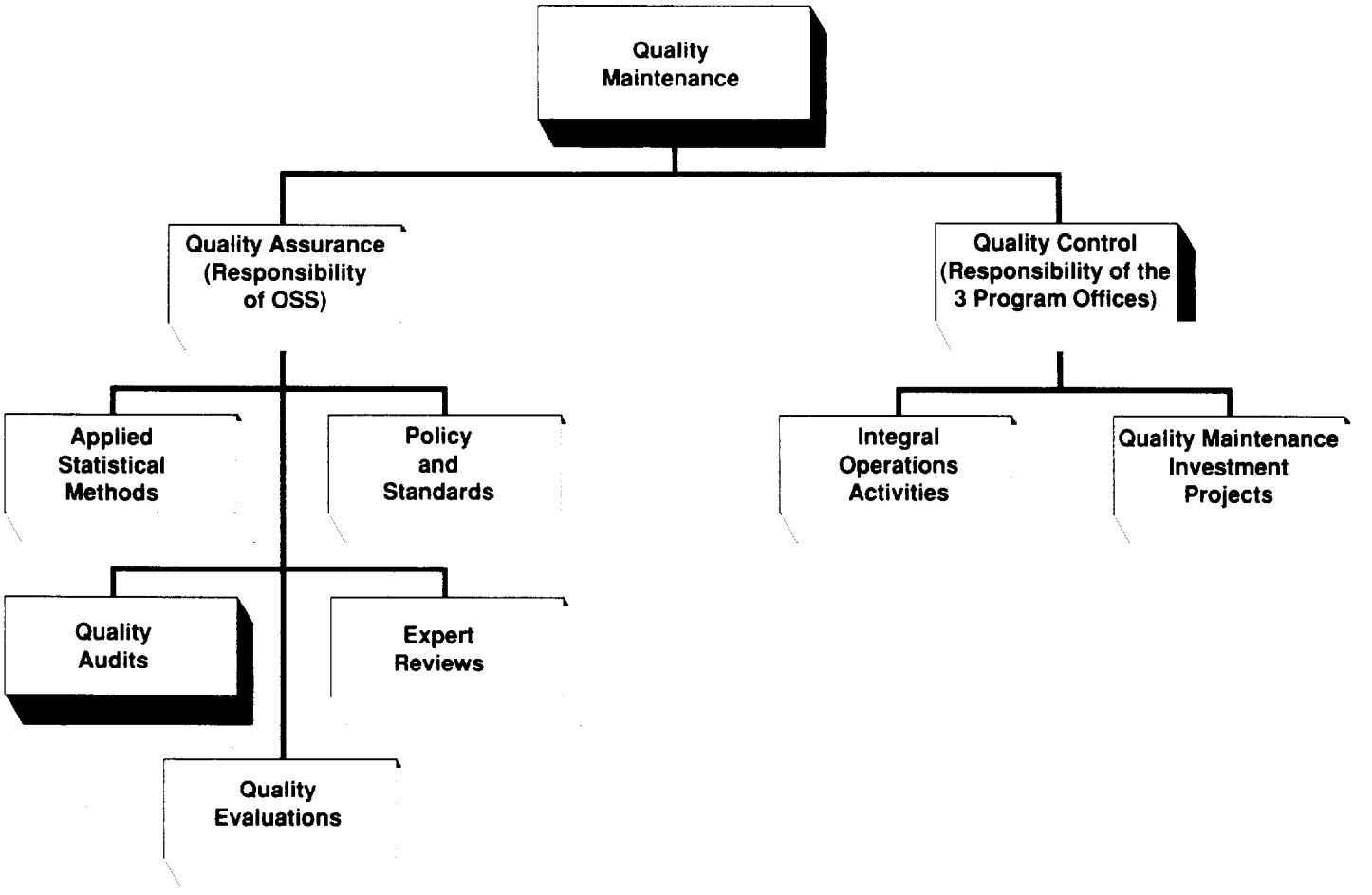
3. PART, *Activities of the Energy Information Administration*, May 7, 1979, p. 21.

4. PART, *Activities of the Energy Information Administration*, Nov. 13, 1980, pp. 23 and 24.

5. PART, *Performance Evaluation of the Energy Information Administration*, PART-82-1, May 19, 1982, pp. 43 and 44.

6. PART, *Performance Evaluation of the Energy Information Administration*, PART-84-1, June 15, 1984, pp. 2–12 and 2–13.

Figure 2.1: Outline of EIA Quality Activities



Source: Prepared by PART from EIA descriptive material on its quality programs.

erations rather than need or any priority system, and the quality control program was based on a budget allocation rather than evaluation needs determining the level of funding.[7]

NEED FOR EIA TO ASSURE THE ADEQUACY OF QUALITY CONTROL ACTIVITIES

Ensuring the quality of energy information was a principal reason for EIA's creation and has been a matter of continuing concern and questioning by the congressional appropriation committees. Although EIA historically has recognized the importance of its quality control and assessment functions, we concluded in our past reports that EIA did not have an adequate basis for making an overall judgment on the quality level of its data. The Administrator did not comment in his response to our 1986 report on our recommendation that EIA assess the adequacy of its quality program and determine the scope and frequency for an adequate program with particular attention to the inclusion of all categories of quality controls.[8]

7. PART, *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, pp. 12, 14, 16, 22 and 23.

8. PART, *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, p. 24.

EIA's quality maintenance budget dropped considerably in the period from fiscal years 1983 to 1987 at a much greater rate than the drop in the total EIA budget in the same period. However, the changes in the quality control program budget cannot be accurately determined because EIA's accounting system was not designed to give precise data on the quality control program.

EIA has cited the importance of quality control, and in budget documents and testimony from fiscal years 1983 to 1988, EIA cited the need for an adequate quality control program. However, frequently in its congressional budget submissions and testimony since fiscal year 1985, EIA has maintained that its quality program was adequate. Other facts discussed below, however, indicate that EIA could not be assured of this.

WHAT IS QUALITY CONTROL?

OSS developed the following list of priority categories of quality control activities.

- *Documentation* is a fundamental tool for effective management and independent verification of operations and output. Adequate documentation enables any competent practitioner to operate the system or model and test or alter it.[9]
- *Frames* are the universes from which EIA collects its data and are fundamental to the production of valid data. Births and deaths[10] of firms result in annual changes to a frame or list that can be as high as 10 to 20 percent; therefore, frames and lists must be updated on a regular schedule.
- *Performance statistics* record measurable aspects of activities over time, providing a baseline to measure change and improvement in the activity.
- *Testing and updating* activities test the performance of some aspect of a system or model to ensure that it is operating according to specifications and performing the intended routine.
- *Special studies* include such items as consolidation and feasibility studies. This covers projects that do not fit into other categories because of overlap or they involve quality control activities not separated into a category.

WHY IS QUALITY CONTROL NECESSARY?

A 1984 EIA study compared the costs and benefits of doing quality control on a regular cycle as opposed to postponing it for 2 to 3 years.[11] The study found that delayed quality control (1) at least doubles the cost of quality control in cases where costs can be measured and (2) cannot be performed in some cases because there was only a onetime opportunity to perform it[12] or it would require rebuilding the entire system. In either case, the delay may necessitate a complete overhaul of the frame at a cost considerably higher than that of periodic maintenance.

For example, the study cited frames maintenance as one area needing constant update. Frames deteriorate over time if they are not continually updated to include new establishments entering the population (births) and remove establishments leaving the population (deaths). Without frames maintenance, only the deaths are likely to be noted to the extent that nonrespondents are followed up.

Data included in the study showed that by not maintaining frames in certain key energy industries, coverage can suffer after only 1 year. Average annual birth rates from 1972 to 1980 in 14 selected types of energy industries ranged from 6 to 40 percent, and death rates ranged from 6 to 13 percent, leaving frames coverage after the first year ranging from 69 to 94 percent. For example, in the petroleum refining industry for every 100 firms in the universe, about 16 were added and 11 dropped out annually. If no frames maintenance were done for 3 years, the relative coverage of the frame would be only 58 percent. The study concluded that a regular update of a frame could cost between $30,000 to $300,000 annually; however, a delay of 2 or more years in maintaining a frame could result in overhaul costs 6 to 10 times greater than regular update costs.

In testimony on the fiscal year 1985 budget,[13] the former Administrator cited the suspension of the EIA Form 172[14] as a case in point where deferral of quality maintenance caused deterioration of the data system to a level of quality unacceptable for publication. According to his judgment the frame had deteriorated due to turnover in the industry to the point that the information from the collection had too great a margin of error to warrant publication. The former Administrator said that fiscal year 1984 funds added by the Committee were used to remedy the quality problems.

WHAT IS EIA SPENDING ON QUALITY MAINTENANCE INVESTMENTS?

Our review of EIA appropriation hearings over the past several years disclosed a continuing concern and questioning by the appropriation committees about the adequacy of EIA's quality maintenance program. However, EIA's accounting system was not designed to give precise data on the quality budget. Quality maintenance investment activities are the portion of quality maintenance that are the responsibility of the program offices which are required to coor-

9. EIA's documentation activities are discussed in detail in chapter 3.

10. Births are new establishments entering the population; deaths are establishments leaving (going out of business or merging) the population.

11. *Quality Maintenance—Cost/Benefit Analysis*, a report dated April 4, 1984, to the Chairman, Subcommittee on Interior and Related Agencies, Senate Committee on Appropriations, prepared by EIA in accordance with the Senate Conference Committee report on the Fiscal Year 1984 Interior and Related Agencies Appropriation Act (P.L. 96-146), p. 1.

12. For example, the monitoring of data collection and the correcting of errors and omissions must be done during the time data are being collected.

13. Hearings before a subcommittee of the House Committee on Appropriations, 98th Cong., 2nd sess., on the Department of Interior and Related Agencies Appropriations for 1985, Part 7, pp. 12 and 36.

14. Covers sales by fuel oil and kerosene dealers.

dinate the planning and operations of these projects with OSS. For example, OSS' analysis of the fiscal year 1986 quality maintenance investment program budget indicates that the total reported by the accounting system was overstated by about 40 percent.

An OPR official informed us that the "quality budget" was one of the more elusive numbers to find in EIA's budget history and that the official budget and accounting system was not designed to track quality items separately. The OPR official maintained that tracking quality costs would result in increased paperwork and costs.

OPR manages a Multiyear Operating Plan as a comprehensive planning, programming, and budgeting system for EIA. The system is used, among other things, to develop EIA's annual budget request and to provide periodic reports on the budgeted cost of each project with a coding of each as to type of project. One of the project types is quality.

As illustrated in figure 2.2, for fiscal years 1985 and 1986, OSS analyzed the quality maintenance investment budgets and came up with totals that were 22 percent and 40 percent, respectively, lower than the totals reported in the Multiyear Operating System. For example, the Multiyear Operating Plan reported a quality maintenance investment budget of $2,182,600 for fiscal year 1986, but OSS' analysis reported $1,315,700, a reduction of almost $867,000. The reduction resulted from the elimination of 10 projects that OSS did not consider to be quality projects.

OSS' revisions to the quality maintenance investment budget generally resulted from (1) quarterly quality control meetings with program office staff or (2) notification by program office staff that projects had changed and were no longer quality oriented. For example, on one $50,000 fiscal year 1986 project, OSS was notified by the program office that the funds were used for a nonquality task rather than the quality task originally planned.

We compared the projects deleted by OSS from the fiscal year 1986 quality budget with their coding in the Multiyear Operating Plan reports over a 23-month period. We noted that the coding of several of these projects as to type and/or their amounts varied considerably over time and that many were not coded as quality projects until the most recent report given to us. Therefore, considerable variation occurred throughout the period in the total amount of quality coded projects.

Beginning with fiscal year 1987, EIA placed complete reliance on the quality control data in its Multiyear Operating Plan and OSS estimates were not made. However, our analysis of the quality maintenance investment budget for fiscal years 1987 and 1988 in the multiyear operating plans indicates that some of the same projects that OSS eliminated in fiscal year 1986 as not quality appear in the fiscal year 1987 and 1988 budgets. If OSS were to have similar conclusions on these projects, the accounting system data could be overstated by about as much as 40 percent for fiscal year 1987 and about 27 percent for fiscal year 1988.

ARE EIA'S QUALITY MAINTENANCE INVESTMENT ACTIVITIES ADEQUATE?

On the basis of OSS data, a total of 28 projects with contract costs totaling $1.7 million were approved for the fiscal year 1986 EIA quality maintenance investment program. This total was subsequently reduced to 21 projects totaling $1.3 million as a result of adding and deleting projects and redefining projects as nonquality. OSS data indicate that the budget for quality maintenance in fiscal year 1986 was 56 percent less than in fiscal year 1985. EIA's accounting data for fiscal year 1988 indicate a decrease of 25 percent in funds budgeted for quality maintenance contracting compared with fiscal year 1986. However, the drop could be much greater because, as previously noted, the quality contract budget for fiscal years 1987 and 1988 as shown in the Multiyear Operating Plan could be overstated by as much as 40 and 27 percent, respectively.

Figure 2.3 shows annually for fiscal years 1983 to 1987 the total EIA budget and the portions of the budget for the three program offices and quality contracts, each expressed as a percentage of those budget figures in fiscal year 1982.[15] Figure 2.3 shows that during the period from fiscal years 1983 to 1987, the portion of the budget for quality contracts was generally considerably below the level of fiscal year 1982. During this same period, the budgets of EIA and the portions for its three program offices were also reduced, but at a much lesser rate. For example, in fiscal year 1987, the total EIA budget and the portion for the three program offices were, respectively, 86 percent and 79 percent of their 1982 levels, while the final portion of the EIA budget for quality maintenance was 56 percent of its fiscal year 1982 level.

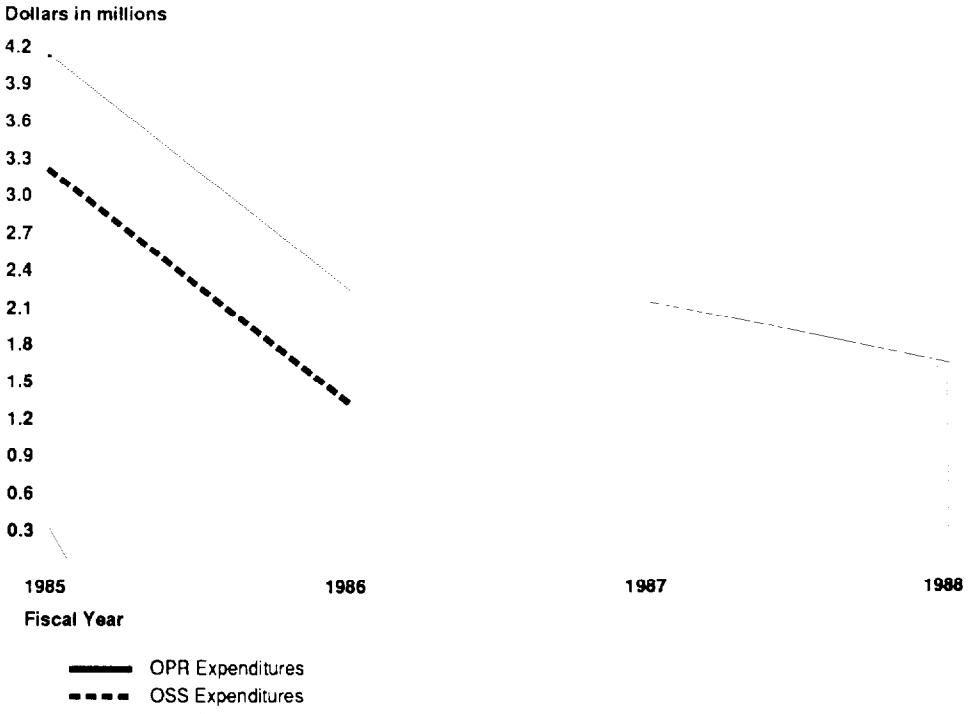
The distribution of the fiscal year 1986 quality maintenance investment budget of $1.3 million by quality control category was as follows:

- documentation, frames, and performance statistics—47 percent;
- testing and updating—27 percent; and
- special studies—26 percent.

In budget documents and testimony from fiscal years 1983–88, EIA supported the need for an adequate quality control program, and often in its congressional budget submission and testimony on appropriations after fiscal year 1985, EIA maintained that its quality program was adequate. We also noted instances where EIA justified in internal budget documents the need for funding levels significantly higher than what was requested in the final budget request to the Congress. In addition, the position of EIA from fiscal year 1985 to 1988 as to what was adequate quality funding changed considerably.

15. 1982 was used because (1) it was as far back as comparable data were readily available and (2) it was at the beginning of the budget reduction period.

Figure 2.2: Quality Maintenance Investment Contract Expenditures[a] for Fiscal Years 1985-88--Comparison of OPR and OSS[b] Figures



[a] In addition to these funds, an estimate was made for each project of the full-time equivalen staff budgeted to work on each project. According to OSS adjusted estimates, this staffin for quality control projects was about 16 for fiscal year 1986.

[b] OSS did not make an estimate for fiscal years 1987 and 1988.

Source: Analysis by PART of data obtained from OSS and OPR on the quality control budgets for fiscal years 1985-88.

In testimony in early 1982 on the fiscal year 1983 budget, when asked about the impact of budget reductions on validation and quality assessment, the former Administrator said that EIA had largely completed the validation studies and was making the improvements indicated by them.[16] The PART report issued in 1984, however, stated that as of late 1982 only 14 of 88 EIA forms (about 16 percent) had been covered by validation studies.[17]

EIA's initial program review budget for fiscal year 1984 identified quality maintenance investment needs totaling $8 million. The former Administrator testified that, in his judgment, $5 million represented roughly a minimum level.[18] The budget submitted to the Congress requested $300,000,[19] and the Congress approved $1.3 million.

In fiscal year 1985 congressional budget hearings, EIA identified 33 projects needed to correct deficiencies in systems or models, of which about 50 percent would be undertaken with fiscal year 1985 funds ($4 million was provided).[20] However, in testimony on the fiscal year 1986 budget, the Administrator said that EIA would be caught up on most of the backlog by the end of 1985 and would come back to a regular maintenance

16. Hearings before a subcommittee of the House Committee on Appropriations, 97th Cong., 2nd sess., on the Department of Interior and Related Agencies Appropriations for 1983, Part 6, pp. 311 and 312.

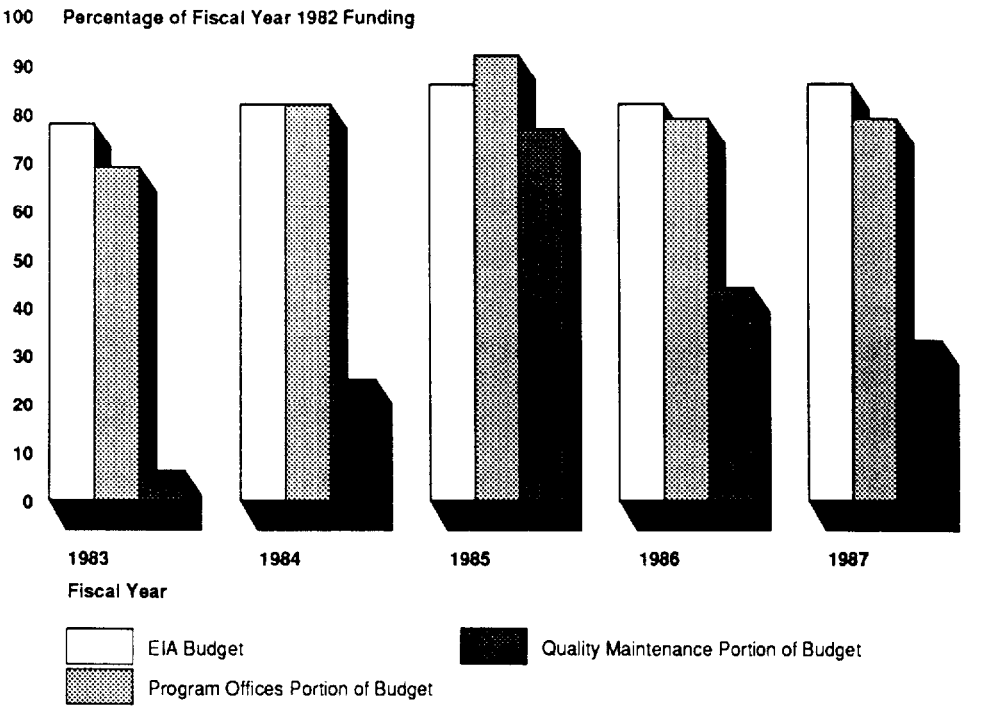
17. PART, *Performance Evaluation of the Energy Information Administration,* PART-84-1, June 15, 1984, p. 2–6.

18. Hearings before a subcommittee of the Senate Committee on Appropriations, 98th Cong., 1st sess., on the Department of Interior and Related Agencies Appropriations for 1984, Part 1, pp. 629 and 630.

19. This included OSS funding only. No quality control funding was requested for the three program offices.

20. Hearings before a subcommittee of the House Committee on Appropriations, 98th Cong., 2nd sess., on the Department of Interior and Related Agencies Appropriations for 1985, Part 7, p. 57.

Figure 2.3 Comparison of EIA Funding and Quality Contract Funding[a] for Fiscal Years 1983 to 1987 as a Percentage of Fiscal Year 1982 Funding



Source: Dollar amounts obtained from EIA budget documents, percentages computed by PART staff.

[a] Quality contract funding is a portion of EIA's annual appropriation budgeted for quality contracts, the only comparable data available for years prior to fiscal year 1985. Automation and identification of quality program codes were not done until fiscal year 1985 and, therefore, final quality contract budget amounts were not available for years before fiscal year 1985. The use of final quality contract budget totals for fiscal years 1985, 1986, and 1987 would result in quality contract percentages of 94, 54, and 56 percent, respectively.

mode.[21] According to the Administrator, $2.5 million, which was the amount requested for fiscal year 1986, was about an ideal amount for annual quality maintenance. He also said that some quality maintenance was being delayed, primarily projects in the categories of testing and updating and special studies. These categories were classified as not as critical as documentation, frames, and performance statistics. The fiscal year 1987 quality budget was $1.7 million.

The need to assess the level of quality control to determine whether it is adequate is underscored by (1) the 8-year cycle for quality audits, (2) the deficiencies disclosed in recent quality audits as discussed in the next section of this chapter, (3) the lack of a formal followup system for quality audit recommendations, and (4) the fact as of June 30, 1987, almost half of the EIA forms in use had never been audited.

NEED FOR ADEQUATE FOCUS AND FOLLOWUP IN THE QUALITY AUDIT AREA

During the early 1980s, EIA shifted from an emphasis on a comprehensive and more costly quality program of validation studies within a 5-year cycle to a much more modest program of quality audits within an 8-year cycle.[22] As of June 30, 1987, almost half of the forms that EIA was using in gathering and analyzing data had never been evaluated either through a quality audit or a validation study. EIA developed a priority schedule for quality audits. We are concerned, however, that the ranking system will not assure the highest quality maintenance priorities because it is based on only two factors that are related to cost—cost of each survey to the government and the

21. Hearings before a subcommittee of the House Committee on Appropriations, 99th Cong., 1st sess., on the Department of Interior and Related Agencies Appropriations for 1986, Part 7, pp. 18, 19 and 36.

22. In its fiscal year 1988 budget submission to the Congress, EIA requested a funding increase to allow 11 quality audits.

burden to respondents—and it does not consider two important factors—the importance and reliability of the data. Also, especially in view of the fact that EIA audits a form generally only once in 8 years, a formal follow-up system is needed to assure that audit recommendations are implemented on a timely basis.

THE EVOLUTION FROM VALIDATION STUDIES TO QUALITY AUDITS

One of the primary ways that EIA evaluates the accuracy of the data it collects and publishes is through quality audits. EIA began performing quality audits in 1983 and by that time it had phased out its validation studies program. EIA believed that quality audits were more focused, more timely, and less expensive than validation studies. The primary purposes of a quality audit are to

- determine whether the manual and automated procedures of the data collection system collect and process data in a manner that ensures data reliability and produces accurate and timely information,
- ensure that the system documentation accurately describes the data collection and processing procedures, and
- evaluate the extent of that system's compliance with current applicable EIA standards.

Beginning in 1985, two checklists were used in performing quality audits—a quality audit checklist and an EIA standards compliance checklist. The quality audit checklist is divided into 17 areas each with from 3 to 18 questions. The standards checklist is divided into 21 areas each covering an EIA standard. An OSS official told us that the most critical quality audit areas involved documentation, frames, and computer coding.

Before 1983, EIA's primary method for assuring data quality was the validation study. Initially it encompassed a comprehensive program plan to validate all of EIA's information systems by 1986 and to perform follow-up reviews of each system at 5-year intervals. The validation studies planned were intended to be wide-scope evaluations of all aspects of EIA's data collection forms, including the statutory basis for the collection, the determination of data needs, the performance of cost-benefit studies, the ability of respondents to provide the data, and the determination of various error rates.

In 1982 we reported that EIA's emphasis on the validation function had been scaled back drastically.[23] Future validation studies would be performed by and at the discretion of the EIA program offices rather than on a comprehensive basis by EIA personnel specialized in this function. Also, the amount of validation work to be performed in each study and the number and frequency of studies would be determined on a case-by-case basis.

Our 1984 report stated that because of austere budgets, EIA decided that validation studies were too expensive to perform, and EIA was substituting quality audits.[24] Between 1979 and late 1982, EIA had completed 14 validation studies, covering about 16 percent of the forms in use as of March 1983.

HOW QUALITY AUDITS ARE CARRIED OUT

As of October 1, 1986, EIA had 84 forms in use. As a general rule, one quality audit is required for each form. However, several forms are either so small or so closely related that they can be covered in one audit, or a few are so large that two audits are required to evaluate them. A total of 54 quality audits are required to evaluate the 84 forms. Of the 84 forms, 40 had been evaluated in 26 quality audits completed or underway as of June 30, 1987. EIA plans to evaluate the remaining 44 forms by performing 28 quality audits (4 audits remaining for fiscal year 1987 and 8 audits per year thereafter) during the period July 1987 through September 1990, resulting in an 8-year time frame for EIA's completion of quality audits on the 84 forms.[25]

As of June 30, 1987, 38 of the 84 forms in use (45 percent) had never been evaluated either through a quality audit or a validation study.[26] Concerning the frequency of quality audits, the Director, Office of Quality Assurance, OSS, said that the present level, which amounts to an 8-year cycle, was about the limit that he could accept. He said that anything longer would concern him.

In our last report we stated the need for an overall plan that would identify the need for, and the relative priority of, quality audits for the individual data collection forms to assure that EIA focuses on the highest quality maintenance priorities.[27] In response to this, EIA developed a tentative schedule to set priorities for quality audits of its forms. We are concerned, however, that the system used for ranking the forms for audit will not assure the highest quality maintenance priorities because the two factors used to rank the forms are related only to cost, and two other factors—the importance to users and reliability of the data—are not considered.

The EIA ranking was based on two factors. First, the forms were ranked according to (1) their cost to the government and (2) their cost to the public as measured by burden to the respondents. The cost score for each form was the weighted sum of the two cost indicators as standardized by EIA. The forms were then arranged in priority order by fuel area. Within a fuel area, the priority was directly related to its cost indi-

23. PART, *Performance Evaluation of the Energy Information Administration*, PART-82-1, May 19, 1982, p. 34.

24. PART, *Performance Evaluation of the Energy Information Administration*, PART-84-1, June 15, 1984, p. 2–6.

25. EIA's request in its fiscal year 1988 budget for funding 11 quality audits would result in completing the first round of audits by about January 1990.

26. Of the 44 forms remaining as of June 30, 1987, to be evaluated by quality audits, 6 had been evaluated by validation studies before 1983, which left 38 forms not evaluated either through validation studies or quality audits.

27. PART, *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, pp. 14–17.

cator; the higher the cost indicator, the higher the priority.

Among the principal objectives of a quality audit of a data collection form are evaluation of the extent of the system's compliance with EIA quality standards, and assurance that system procedures collect and process data in a manner that ensures data reliability and produces accurate and timely information. We believe that the two ranking factors used by EIA should be neither the only nor the primary ranking factors. We believe that the following two broad areas relating to the importance and reliability of the data should also be considered in setting quality audit priorities:

- The importance of the data collected by the form. In determining importance, among the factors that could be considered are the national security implications of the data, the use of the data for important federal and state policy decisions, and the use of and reliance on the data by a wide audience both in government and private business.
- The stability and reliability of the data base. Two factors that could be considered are a history of frequent and significant changes in the data base and known or suspected problems with the data base.

RESULTS OF QUALITY AUDITS

As of June 30, 1987, a total of 12 quality audit reports had been issued using the checklist format. The checklist contained over 100 items categorized into 17 areas. Not all of the 100 items are applicable to every form. The contractor performing the quality audit for EIA can check off each item as satisfactory, unsatisfactory, or not applicable. For the 12 reports the applicable checklist items ranged from 41 to 116, and for 6 reports the number of items checked as unsatisfactory totaled one-third or more of the total applicable items. For four of the checklist areas, one-third or more of the items were checked as unsatisfactory, as follows:

- major frames for all 12 reports,
- nonresponse followup for 9 of 12 reports,[28]
- master file update for 8 of 12 reports, and
- manual screening for 7 of 12 reports.[29]

Each quality audit report makes recommendations for improvements in forms. However, EIA does not have a formal followup system to assure that quality audit recommendations are implemented by the program offices. The Director, Office of Quality Assurance, OSS, told us that when OSS and the program office disagree on a recommendation, it is referred to the Administrator. The Administrator decides whether the recommendation will be implemented.

A followup and report on quality audit recommendations were done in mid-1986 by an EIA contractor.[30] The report was a onetime effort and covered seven quality audit reports done in the period from March 1984 to January 1985. The followup disclosed the following on the status of the 42 recommendations:

- 21 were fully implemented,
- 5 were still being implemented,
- 12 were partly implemented, and
- 4 had not been implemented.

The net result was that from 1½ to 2½ years after the recommendations were made, about half of them had not been fully implemented.

The Director, Office of Quality Assurance, OSS, believed that a routine followup mechanism was desirable but lost out to higher priorities, such as quality audits. He agreed that such a system was probably needed in view of the 8-year time lapse between quality audits.

28. EIA standards establish procedures for minimizing survey nonresponse, including followup and various other techniques.

29. Consists of a preliminary check of the completeness of the forms received from the respondents.

30. *Quality Audit Recommendations Follow-up Review*, Aug. 29, 1986, report prepared by Westat, Inc.

CONCLUSIONS

In our last report, we recommended that the Administrator assess the adequacy of quality control activities, with particular attention to the inclusion of all categories of quality controls.[31] The Administrator's comments on our last report did not specifically address this recommendation.

Although EIA's data indicate that quality maintenance investment programs considered all quality control categories, the data also indicate that the relative share of the EIA budget devoted to quality maintenance investment has dropped significantly from fiscal years 1983–87. The quality control program also continues to be tailored to the budget levels rather than the reverse.

Further, EIA's own study found that delaying quality control can significantly increase its cost in some cases, or prevent its performance in other cases, resulting in inaccurate data and models. Because of these consequences, we believe that EIA needs to determine what scope and frequency of quality activities constitutes an adequate quality control program.

If EIA determines that, because of other priorities it cannot fund what it has determined to be an adequate quality program, whenever the lack of quality maintenance could impose limitations on the data and analyses of a published report, EIA should disclose this fact by stating a limitation on the data.

Although there has been continuing congressional concern over the adequacy of the quality control budget, an EIA official told us that the EIA accounting system was not designed to give precise data on the quality control program budget. Without precise data, we believe that it is difficult for EIA to (1) assess and plan for an adequate quality control program and (2) adequately inform the Congress on its program.

31. PART, *Performance Evaluation of The Energy Information Administration*, PART-86-1, Apr. 16, 1986, p. 24.

As a result of budget reductions in the early 1980s, EIA shifted from a comprehensive quality program of validation studies on a 5-year cycle to a more modest program of quality audits on an 8-year cycle. As of June 30, 1987, EIA had evaluated slightly over half of the 84 forms in use either through a validation study or a quality audit, and quality audits of the remaining forms will not be completed until fiscal year 1990. EIA developed a tentative schedule for quality audits, but the factors used to set priorities for audits of the forms were more related to cost than to quality. Also, EIA has no formal system of followup on quality audit recommendations.

We believe that EIA needs an overall plan that would identify the need for and the relative priority of quality audits for the individual data collection forms to assure focus on the highest quality maintenance priorities. We believe that the factors used in setting priorities should include ones that consider the relative importance of each data form and its stability and reliability. Because EIA audits a form generally only once in 8 years, a formal follow-up system is needed to assure that audit recommendations are implemented in a timely manner.

One of the principal reasons for establishing EIA and PART was that the Congress did not have confidence in exiting federal energy data and analysis. Ten years have passed since PART began reporting on its evaluations of EIA. This report and each of the six previous PART reports concluded overall that EIA did not and still does not have an adequate basis for evaluating the quality of its data and analysis products. Since 1982 significant reductions have occurred in the quality contract budget. PART acknowledges that some improvements have been made over the years, but after a decade, PART concludes that greater efforts are both imperative and possible.

PART believes that EIA's actions on PART's recommendations in the quality area have been slow and limited. PART believes that EIA must take timely action on the issues PART has raised concerning EIA's quality programs. Progress over the past 10 years does not lead to assurance that high quality data for all data systems will emerge in a reasonable time in the future.

RECOMMENDATIONS

To ensure the quality of energy information and effectively plan and carry out quality control activities, we recommend that the Administrator:

- Assess the adequacy of current quality control activities with emphasis on the scope and frequency of these activities. Once the appropriate scope and frequency of quality control are determined, EIA should estimate the staffing and resources needed to carry out the program.
- Take the necessary steps to provide more precise financial data on the quality maintenance investment program.

We recognize that there is competition for limited funding and that quality control activities represent only one area of EIA's responsibilities. Therefore, we recommend that the Administrator provide that whenever curtailments in EIA's quality programs impose limitations on the data and analyses in a report, this fact be disclosed by stating a limitation on the data. This disclosure could be done through (1) providing in each affected published product an explanation of any possible limitations and (2) providing in EIA's annual report to the Congress a summary of such limitations.

To assure focus on the highest quality maintenance priorities, we recommend that the Administrator:

- Systematically plan and carry out quality audits of EIA's data collection activities. In determining the audit priorities of the various forms and the frequency that each should be audited, adequate consideration and priority should also be given to factors relating to (1) the importance of the data collected by each form and (2) the stability and reliability of each data base. Such factors could include the national security implications of the data in the form, use of and reliance on the data by a wide audience, the frequency of fluctuations in the data base, and known or suspected problems in the data base.
- Establish a formal follow-up system to assure that quality audit recommendations are implemented in a timely manner.

AGENCY COMMENTS

EIA took issue with PART's conclusion that EIA does not have assurance that its quality control is adequate and that EIA needs to determine what scope and frequency of quality activities constitutes an adequate program. EIA stated that the report fails to recognize that quality maintenance investments are only a small subset of the overall EIA quality control program and are not the total measure of EIA's quality efforts. In addition, EIA believes that it has assessed the adequacy of its quality control program through the combination of its Multiyear Operating Planning process and OSS quality assurance activities.

PART's concern was that EIA lacked sufficient assurance on the adequacy of its quality control program, not that the program was inadequate. PART recognizes that a considerable amount of important quality control is performed by EIA's program offices. The primary feedback to the Administrator on the adequacy of these activities comes from quality maintenance projects and OSS activities such as quality audits. Therefore, our review concentrated on the adequacy of these programs for assuring the Administrator of the quality of EIA's data collection and analysis systems. We have added language to the report to clarify our concern.

EIA believes that it has assessed the adequacy of its quality control program through its Multiyear Operating Planning process and OSS quality assurance activities.

This is the same system about which we expressed concerns in our last report.[32] In that report we concluded that the approach used in developing the quality control program based the program on a proposed budget allocation. We continue to believe that evaluation needs should determine the level of funding rather than available funding determining the extent of evaluation.

With regard to our recommendation that the Administrator take the necessary steps to provide more precise financial data on the quality control program, EIA disagreed. EIA believed that changing its accounting system to capture the level of detail that PART suggested is not necessary or appropriate since the costs would outweigh the benefits. The intent of PART's recommendation was to obtain more precise data only on the quality maintenance investment portion of EIA's quality control program, which in our view will not necessitate a revision of EIA's accounting system. We believe that an annual analysis similar to the OSS analysis described in this chapter could provide a more accurate and useful picture of quality maintenance efforts. We have, however, made our recommendation more specific, based on EIA's comments.

Concerning our recommendation that disclosure be made whenever curtailments in EIA's quality programs could significantly affect the data and analyses in a report, EIA maintained that it does not publish data or analyses for which it was not willing to stand by the quality, and stated that any report requiring such a statement should simply not be published. EIA's response indicated satisfaction with the EIA quality control system. However, we believe that the problems discussed in this chapter regarding EIA's quality programs raise questions as to whether top EIA management has sufficient assurance that it will get appropriate warning if significant quality problems arise.

EIA believed that the report presented a purely quantitative view of quality audit findings, with no qualitative assessment of the significance of the findings. EIA stated that of the approximate 100 items in a quality audit checklist, some are critical or fundamental while many are of lesser importance. EIA maintained that the vast majority of the quality audits' findings discussed in the PART report fell into the noncritical categories of enhancements or improvements. We disagree with EIA for the following reasons.

We did qualify the relative importance of the various quality audit areas by noting the more significant ones as identified by an OSS official. In summarizing the quality audit checklist findings, we used a format similar to one used in an OSS report on quality control, which we do not believe was a purely quantitative presentation.[33]

With respect to how critical quality audit findings were, recent audits disclosed a substantial amount of noncompliance with several quality standards, including those in three areas cited by EIA as important—frames development, frames maintenance, and performance statistics (see app. II for additional PART comments on this). We believe that this indicates that something more serious could exist in these areas than merely a need for noncritical enhancements or improvements.

We recommended that EIA systematically plan and carry out quality audits, giving consideration to the importance of the data collected by each form, and knowledge of the stability and reliability of each data base. EIA said that in response to a prior PART recommendation for a long-range plan to audit all systems, it concluded that cost and respondent burden were a good measure of the importance of the surveys. EIA agreed that in its annual re-evaluation of its long-range audit plan it would consider such factors as PART has suggested.

EIA agreed with our recommendation that it establish a formal follow-up system to assure that quality audit recommendations are implemented in a timely manner. EIA stated that it has implemented a formal follow-up system. While we believe this system is a step in the right direction, it does not include verification, which we believe is necessary, at least on a sample basis. Also, the follow-up procedures have not been formalized in the sense of being in a written form in an EIA policy directive or memo.

Under EIA's system, agreement is reached with the program office as to the date by which each quality audit recommendation is to be implemented. The director of the program office is subsequently required to certify to the Administrator that the recommendations have been implemented. The system relies on certification rather than verification that the recommendations have been satisfactorily implemented.

32. PART, *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, pp. 21 and 22.

33. *FY 1986 INTERIM QUALITY CONTROL REPORT*, OSS, Dec. 1986. On pages 16 and 17 OSS discussed quality audit results in terms of (1) the number and percentage of checklist items that were satisfactory and (2) the concentration of unsatisfactory ratings in 4 of the 17 areas in terms of the ratio of unsatisfactory items to total items in each area and form.

DOCUMENTATION PROGRESS CONTINUES

EIA is required by provisions of the DOE Organization Act to ensure that adequate documentation for its statistical and forecast reports is made available to the public when the reports are published. Models provide the basis for forecast reports, and computer-based data collection systems supply the basis for statistical reports.

Model documentation includes a description of the purpose, methodology, assumptions, capabilities, and limitations of the model. It facilitates revising or updating the model and training new users of the model. It also promotes the credibility of the model by providing a basis for users to acquire an understanding of its capabilities and limitations.

Documentation for computer-based data collection systems serves similar purposes and includes descriptions of the data to be collected, the computer system and its program, and other information for those who operate and maintain the system and use the reports generated by it.

Our past reports described EIA's efforts and progress in adequately documenting its models and data collection systems and made recommendations for strengthening the process. The Administrator's policy statements have reinforced the statutory requirements and stressed to senior EIA staff the importance of bringing documentation up to EIA's standards. Our 1984 and 1986 reports recognized that EIA had made progress, but noted that more needed to be done to establish documentation meeting EIA's standards for all models and systems.

Since our 1986 report, EIA has continued to bring more model and data system documentation into compliance with its documentation standards. Documentation for additional models has been completed, reviewed, and found to comply with the applicable standards. An overall review of data system documentation has been completed, and the required documentation was found to be in existence for most systems reviewed. As EIA completes the required documentation, it needs to turn its attention to examining the adequacy of that documentation.

MODEL DOCUMENTATION NEARLY COMPLETE

Our past reports have detailed EIA's progress in completing documentation for its models. In 1986 we reported that EIA had 33 active models in use of which 27 were basic models and that documentation for 19 of them met the applicable documentation standards.[1] As of June 1987 the number of active models has increased to 37, of which 32 were basic. All the required documentation existed except for one of the basic models.

April 1984 instructions from the former Administrator to senior EIA staff stated that every data collection system and model must be documented to EIA's standards by April 1985 or scheduled to be completed by October 1986. In addition, the instructions stated that no proposal for a new data system would be approved unless the proposal provided for documentation to EIA's standards. These instructions also stated that beginning March 1, 1985, no EIA report would be issued unless any forecasting model or data collection system on which it was based was documented to EIA's standards.

In commenting on our 1986 report, the Administrator noted that EIA was on schedule with respect to bringing all documentation into compliance with EIA's standards. EIA officials responsible for the one model lacking documentation informed us that it had undergone revisions during the past year and that a contract was being processed which would provide for creating the documentation.

1. PART. *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, p. 18.

DATA COLLECTION SYSTEMS—PROGRESS IN DOCUMENTATION

In February 1987, OSS issued a report on its review of the status of documentation for data collection systems.[2] This review focused on the existence of documentation rather than its adequacy. Each data collection system included in the review was required to have three manuals—data user's, operations, and program—to comply with the documentation requirements. The report found that of the 57 systems:[3]

- 38 systems had all the required manuals,
- 5 systems had no manuals,
- 3 systems had only one manual, and
- 11 systems had only two manuals.

After the review was completed, program offices reported to OSS that with the exception of one operations manual, all the required documentation had been prepared. The one exception was the operations manual for a data collection that is no longer sponsored by EIA, and the responsibility for the manual now rests with a DOE program office. Thus, according to EIA's three program offices, all the required documentation exists for the data collection systems covered by the systems documentation review. However, this had not yet been verified by OSS.

2. *Status Report on EIA Systems Documentation*, EIA, Office of Statistical Standards, February 1987.

3. At the time the review started in 1984, EIA had 67 data systems, 65 of which were automated and subject to documentation requirements. Of the 65, 2 were canceled during the review, 1 was replaced, and 5 were in the process of having their documentation prepared. This left 57 data systems to be reviewed by OSS.

Documentation reviews are needed for 13 data systems—the 5 that were not included in the OSS review because documentation preparation was in process at the time of the review, and 8 systems created since the review was begun. An OSS official informed us that plans are being developed to review these systems but that no firm schedule has been established.

EFFORTS TO DETERMINE ADEQUACY OF DOCUMENTATION

Now that EIA has made substantial progress in completing documentation required for models and data collection systems, it should set about determining the adequacy of that documentation. While EIA documentation standards specify what elements of documentation are required, and EIA has generally created the required items of documentation, our current work shows that EIA lacks information on the adequacy of this documentation. The model quality audit program that EIA has initiated should begin to provide this type of information.

At the end of our review, EIA had completed documentation for all but one of its basic models and had recently completed a review of data systems documentation which found the required documentation existed for most of the systems reviewed. However, neither of these efforts attempted to evaluate the adequacy of documentation; they only determined the presence or absence of documentation required by EIA's standards. PART believes information on the adequacy of documentation is necessary to reach a judgment on its reliability and completeness.

The primary information EIA has developed concerning model documentation, however, is whether the currently active models have the required items of documentation. EIA did not evaluate the quality of the documentation. Information on the quality of the documentation is necessary to reach a judgment on its adequacy and the need for revisions or additions. Information on model documentation quality also helps verify claims for model capabilities, assesses support for model applications, and identifies needed improvements.

The OSS has issued one report[4] on a model quality audit that is similar to quality audits performed of data systems (see ch. 2). The purpose of a model quality audit is to

- check the compliance of model documentation with EIA documentation requirements;
- assure that the model documentation and archive tape are describing the same model;
- verify claims for model capabilities;
- assess the economic, mathematical, and empirical support for the model in its usual applications; and
- recommend model improvements, applications, and reliability statements.

OSS's audit report disclosed that the documentation was incomplete and made recommendations for completing it as well as adding items missing altogether. It also noted that the current version of the model was not the one described in the documentation. According to OSS officials, another model quality audit has been performed and the report was being prepared at the end of our review.

Information EIA has on data systems documentation comes primarily from a review conducted by OSS. The OSS review was intended to identify areas of strengths and weaknesses as indicated by the presence or absence of information. Limited information is available on the adequacy of the documentation, developed as part of quality audits performed by OSS (see ch. 2). One of the areas reviewed in a quality audit of a form is the system documentation. For example, information developed during 10 quality audits of data systems completed from September 1985 through the end of 1986 showed that documentation examined during 9 of the 10 audits only partially satisfied requirements for documentation of processes and procedures.

4. *Model Quality Audit, Oil Market Simulation Model*, EIA, Office of Statistical Standards, Nov. 18, 1986.

CONCLUSIONS

EIA has made substantial progress by continuing to increase the number of models and data collection systems that have the documentation required to meet its standards. At the close of our review, all but one model was documented and documentation reviews for 57 data systems had been completed. Thirteen data collection systems, some of which are relatively new, have not been reviewed to determine if they have the required documentation.

EIA now needs to turn its attention to examining the adequacy of its documentation. Although EIA has determined that the documentation exists, judgments concerning documentation are quantitative rather than qualitative because EIA knows little about the quality of the documentation. Limited information is available on the adequacy of data systems documentation, even less concerning model documentation. The available information shows the documentation for both to be incomplete.

Simply knowing that documentation exists is not sufficient. For documentation to be useful, it must be current, complete, and accurately represent the model or data system. To enhance the understanding and acceptance of models and data systems, their documentation should be subjected to quality evaluations. Such evaluations verify claims for model capabilities, assess support for model applications, and identify needed improvements. Quality of data collection systems documentation is addressed by our recommendations on quality audits in chapter 2.

In view of the importance of verifying the quality of documentation, EIA's April 1984 policy relating to model and data system documentation should be expanded to also require determination of the adequacy of documentation for models and data collection systems.

RECOMMENDATIONS

To comply with legislative requirements for documentation and enhance the reputation of EIA's models and data collection systems, we recommend that the Administrator:

- Ensure the prompt completion of EIA's evaluation of whether documentation meeting its standards exists for data collection systems. If data systems are found to lack documentation, a plan should be established to complete the required documentation, setting target dates and establishing responsibility for its preparation and completion.
- Have documentation promptly completed for the one model that lacks it.

The Administrator should revise EIA's April 1984 policy relating to model and data system documentation to require an evaluation of the adequacy of the documentation.

To provide a basis for determining the adequacy of model documentation, we recommend that the Administrator

- establish a program to evaluate systematically the adequacy of model documentation; the program should include a specified schedule for conducting the evaluations.

AGENCY COMMENTS

EIA believed that our conclusion that EIA had uncertain knowledge of the adequacy of its documentation was both vague and unjustified. Our conclusion was much broader than this. Our report recognizes that EIA has made substantial progress toward completing model and data system documentation. However, we expressed concern that EIA has limited information with which to judge adequacy or quality of the documentation.

Concerning our recommendation that EIA complete its evaluation of whether documentation meeting its standards exists for data systems, EIA says that documentation exists for all 66 data systems and all but 13 have been checked for completeness during data systems reviews. While EIA's statement that data systems documentation has been checked is true, the fact remains that EIA's own reviews found the documentation to be incomplete. For example, while all but one of eight data systems receiving quality audits from January 1986 through June 1987 had the required items of documentation, in only one case did the required items fully cover all processes and procedures. EIA stated that documentation will be completed for the one model lacking it, as soon as the revision of the model is complete.

Concerning data systems documentation, EIA states that documentation exists for all data systems. Until reviews are completed of the remaining 13 systems, we do not believe that it has assurance that this is an accurate statement. Further, reviews that EIA has completed have identified incomplete documentation and other deficiencies in some data systems, the correction of which have not been independently verified by OSS.

EIA further states that documentation of data systems to its standards is for internal use only and that PART has confused two issues—providing adequate documentation to meet legislative requirements and completing documentation to EIA's standards. PART has not confused these issues. EIA's statement is contrary to its own internal guidance. We believe it is clear that documentation of data systems to EIA's standards was intended in response to the legislative requirement. The Administrator's memorandum of April 10, 1984, to senior staff stated that beginning March 1, 1985, no report based on any EIA forecasting model or data system would be cleared for release unless the model or system has been documented to standard. Thus, PART believes that there is a very clear relation between the legislative requirement for documentation and EIA's standards for documentation.

With regard to the adequacy of data systems documentation, EIA notes that the process of examining documentation includes determining whether the data system adequately and accurately reflects the processing system and whether the model has a good economic and/or statistical basis. EIA states that with respect to data systems, this is accomplished through the conduct of quality audits. We note that quality audits have been performed for slightly more than half of the data systems. Given this level of coverage, we believe that EIA lacks enough information to make an overall judgment on the adequacy or quality of its data systems documentation.

Despite its disagreement with our concern over the extent of information it has to judge the quality of data system documentation, EIA has initiated a new review of all 66 systems, rather than just the 13 not included in previous reviews. This new review utilizes a checklist based on a revised EIA documentation standard, and will place greater focus on the documentation than the previous review which was more hardware-oriented. The new standard, and consequently the checklist, provides a more detailed description of systems documents and the required components of each document. This, together with the completion of quality audits and the correction of deficiencies identified by these audits, should help provide the type of information we believe EIA needs.

With respect to our recommendation for a systematic evaluation of the adequacy of model documentation, EIA believes that the adequacy of documentation has been verified by in-house and independent reviews accomplished over the past several years. This does not, however, represent the formalized

comprehensive approach we believe is needed and which was intended by our recommendation. As discussed in our report, we believe that assessments such as EIA's recently instituted model quality audit program would provide information of the type we believe it needs. According to the Director of Quality Assurance, model quality audits will provide a more formal and documented review of models, consisting of (1) verification of documentation and archiving, (2) independent review of economics, and (3) a quantitative review focusing on the quality of the quantitative aspects of the model.

Model quality audits will certainly provide EIA with more information on which to reach judgments about the quality of its models, and we continue to believe reviews such as this are both useful and necessary. To illustrate this need, as discussed in this chapter, the one model quality audit completed at the time we finished our review found documentation to be incomplete and not in agreement with the current version of the model. It also noted some items were missing altogether.

EIA'S INDEPENDENCE AND OBJECTIVITY

The Congress, in creating EIA, made clear the need for EIA to remain independent and to be separate from energy policy formulation and advocacy functions. In our past reviews we found no reason to question EIA's independence, although we did note the need for EIA to improve some of its internal controls. In our 1986 report we recognized that EIA had taken some action to address our prior recommendations concerning internal controls. However, we also identified an instance where failure to disclose adequately EIA's role in establishing criteria for a study performed for the Secretary of Energy could give the appearance of a lack of EIA's independence. While EIA has established procedures to protect and preserve its independent status, it needs to strengthen implementation of these procedures.

In our current review we noted that EIA could strengthen its appearance of independence and enhance understanding of the process by which its analysis products are produced. While EIA has established a system to monitor client-requested analyses, it has not fully utilized it as an evaluation tool in assessing program offices compliance with the established procedures. In addition, the way in which disclosure of EIA's role is made in some analysis products does not sufficiently bring this important matter to the attention of report users. In this connection, we believe the usefulness of EIA's reports would be enhanced by adding a section disclosing how the work was accomplished.

SYSTEM TO RECORD AND TRACK CLIENT-REQUESTED ANALYSES

EIA has traditionally provided studies and analytical assistance requested by government agencies and congressional committees as part of its overall mission to provide objective information to policymakers and others. Recognizing the importance of maintaining its independence while providing this assistance, EIA has established procedures to record the assumptions used in its analyses and to describe those products prepared at a specific client's request.

In our 1982 report we recommended that EIA establish a central system for recording analyses involving client-specified assumptions.[1] EIA agreed with our recommendation and stated that an analysis tracking system was being developed. Although EIA made several attempts to establish interim systems, it was not until October 1985 that an order was issued establishing a formal tracking system to monitor actions on client requests. In our 1986 report we noted that the order establishing the system had just recently been issued, and stated our intention to examine EIA's implementation of the order. Because OPR already had an evaluation study underway at the beginning of our review, we monitored that effort.

OPR instituted an audit in May 1986 to assess the program offices' implementation of and compliance with the EIA order establishing the tracking system. According to the audit manager, its primary goal was to assess compliance with the order by determining if the requests for analyses, called service requests, were being properly entered into EIA's automated centralized management system, the Activities, Resources, and Results Information System (ARRIS). Data entered into the system would enable EIA managers to track the service requests and to identify those with client-supplied assumptions.

Although the ARRIS system is used to produce a number of management reports, including four specifically relating to service requests, the audit manager indicated that he had requested a new report that would have assisted him in evaluating the extent to which the program offices were complying with the order. However, the report was not produced. According to the manager of the ARRIS system, this was due to a lack of resources.

We asked the manager of the tracking system audit how the lack of the new report would affect his ability to perform the assessment. He said that while not having the report would not prevent an assessment of compliance with the order, it would require the cumbersome process of manually extracting a relatively few service requests from a much larger universe of reports logged into the ARRIS system. He also said that while he had already assumed that the report was not going to be produced, our question as to the effect of not getting the report was the first direct confirmation that he would not be getting it. He said that he would have to develop the material manually, which never happened.

During our work, we made contact with the audit manager several times to inquire as to the progress and completion of the audit. Each time we were informed that it had still not been completed but that either (1) some progress had been made or (2) higher priority matters had kept him from completing it. In early March 1987 we were informed by the manager that because EIA was considering revising the tracking system order, the

1. PART, *Performance Evaluation of the Energy Information Administration*, PART-82-1, May 19, 1982, p. 22.

audit was not going to be completed. He said that he intended to prepare a summary of the work he had completed along with his observations based on that portion of the audit. He prepared a summary of the portion on the work completed, indicating that it did not represent a full audit.

We discussed the proposed changes to the tracking system order with the Director of Resource Management, OPR, the individual responsible for this order. We noted that the proposed revisions to the order had caused the termination of the assessment project, and asked what sort of changes were being considered. He said that only one change was being considered, which would result in EIA's role in service reports being more clearly defined. He said that this concern addressed the packaging and presentation of the reports, rather than the internal processes involved in their preparation. The order would strengthen the requirements for disclosing EIA's role, rather than changing the way EIA monitored service requests through the ARRIS system. Accordingly, since the proposed changes would not affect the operation of the tracking system, there seems to us to have been little reason to terminate OPR's audit.

EIA'S INDEPENDENCE

Maintaining EIA's independence and objectivity is an issue of primary importance. Our 1986 report recommended that each EIA report fully disclose the scope and the extent of both EIA's and the requester's involvement in establishing study criteria for client-requested analyses.[2] The intent of this recommendation was to define clearly EIA's role in performing analyses for clients and to preserve both the fact and appearance of EIA's independence. Although the Administrator has acknowledged that EIA must be particularly sensitive to protecting its independence, in commenting on that recommendation, he stated that he believed disclosure of EIA's role in an appendix to a service report was sufficient.

As stated in our 1986 report, we do not believe that the disclosure made EIA's role clear enough and that locating it in an appendix did not sufficiently bring this important matter to the attention of report users. Although EIA did not agree with our recommendation, it has apparently reconsidered its prior position because in its November 1986 report on the uranium industry, specific reference was made to EIA's role in the Executive Summary of the report.[3] Moreover, at the conclusion of our review EIA was considering revising its internal guidelines to strengthen the requirements for disclosing EIA's role in service reports.

In the past, EIA had specific guidelines stressing the need to clearly maintain its independence. When the tracking system order (see previous section) was issued in October 1985, it canceled previous orders dealing with (1) providing services to non-EIA clients, (2) recording and responding to requests for analytical services, and (3) clearance of analytical services. When the new order was issued, it incorporated many, but not all of the provisions of the earlier orders. Where previous guidelines stressed the importance of maintaining both the fact and appearance of independence, the revision did not make specific reference to the importance of maintaining EIA's independence.

We brought this apparent omission to the attention of EIA officials, pointing out what appeared to be an oversight in the combination and revision of the old orders. At first the officials indicated that they believed specific reference to the importance of maintaining independence was still in an existing order, but after checking, they advised it was not. When we suggested the need to reestablish a clear statement regarding the importance of independence into the order, the officials informed us that they were comfortable with what existed and did not believe that any additional requirements were necessary.

In view of the expressed congressional concern with maintaining EIA's independence, we continue to believe that it is important for EIA's role and the required safeguards to be spelled out clearly both in terms of policy and operational guidance as well as in published reports. Specific requirements focusing on the issue can only enhance EIA staff awareness of the importance of both maintaining and demonstrating EIA's independence and objectivity. Clearly and prominently spelling out EIA's role in published products can only increase confidence in the independence and reliability of EIA products.

MORE FULLY EXPLAINING METHODOLOGY IN REPORTS

We noted that the disclaimer appearing on the cover of service reports was at best confusing if not misleading, and information contained in the reports which would help the user understand how it was prepared was not readily accessible.

Service reports have a disclaimer on their lower front cover to alert users to the fact that they are not the usual EIA product. We noted the disclaimer suggested that the internal EIA review of the analytical work involved was not the same as for other EIA reports, and therefore the information contained therein may not meet the same standards. We discussed

2. PART. *Performance Evaluation of the Energy Information Administration*, PART-86-1, Apr. 16, 1986, p. 37.

3. *Domestic Uranium Mining and Milling Industry: 1985 Viability Assessment*, DOE/EIA-0477(85), November 1986, p. ix.

this with EIA officials who confirmed that this was not the case, as the disclaimer was intended to address the review process, not the quality of the data or analysis. In this respect, the disclaimer seemed too harsh or severe, and may actually do EIA a disservice.

To illustrate, a typical disclaimer on a service report read, "This report has not received a complete technical review by the Energy Information Administration (EIA) and, therefore, should not be represented as an official EIA product." A clearer statement on the cover, supported by an expanded explanation in the body of the report, could provide report users a much better and more accurate understanding of how the report was produced.

In this regard, the usefulness of EIA reports, and confidence in their independence and objectivity, could be enhanced by including in them a section that informs the reader how the underlying work was accomplished—similar to the objectives, scope, and methodology section of this report (see ch. 1). Such a section could inform the reader of:

- How the analysis was performed and any special limitations that apply, such as to internal reviews or other issues addressed by a disclaimer on the report cover.
- What data series are involved and references to any sources of information on that data, such as state-of-the-data reports or quality audits.
- What models may have been used and how the report user can obtain information on them, such as the model abstract report or model documentation.
- A general description of how the analysis was conducted.

This type of information could give the report user a broader knowledge of the analysis by providing an understanding of the measures taken and procedures followed, and at the same time hold down the volume of technical information in the report by incorporating it by reference. The report user would have details on how the analysis was conducted as well as references to additional technical information, if desired. Increased user understanding could also reinforce confidence in the objectivity and independence of EIA's work.

We discussed with responsible officials the feasibility of adding a scope and methodology section to EIA reports. They indicated that although the idea of a section to spell out what did or did not take place in preparing EIA's reports had never been considered, it did seem reasonable and appeared to have merit. They said that these comments, as well as our view on the disclaimer, were "helpful comments" for their use when considering revisions to EIA's internal guidance.

CONCLUSIONS

Some of EIA's internal controls with respect to independence and objectivity could be improved. EIA has not effectively used its existing tracking system to assess its management of service requests, and revisions could be made to its products to give users a clearer understanding of how the reports were prepared and of any limitations that apply.

Although EIA has established a system to approve, record, and monitor the status of analysis request work, it has not used the system as a management tool to assess the extent to which program offices are complying with the established procedures in managing requests. An OPR audit of the system was terminated before completion. Without such an assessment, program office compliance with requirements for recording and managing service requests remains unknown.

Our 1986 report concluded that the role EIA played in performing an analysis for the Secretary of Energy was not disclosed in a manner sufficient to bring the matter to the attention of report users. Although the Administrator acknowledged that EIA must be particularly sensitive to protecting its independence, he believed that adequate disclosure had been made. We continue to believe better disclosure needs to be made. The Administrator has apparently reconsidered his position, however, as the very next report on the same subject made much clearer disclosure of EIA's role.

The disclaimer appearing on the cover of EIA service reports does not give report users a clear understanding of the review process. In addition, the usefulness of EIA's products could be enhanced by an objectives, scope, and methodology section which would give the report user a broader knowledge of the underlying analysis and data by providing an overview of the process as well as specific references for more detailed information. Use of an objectives, scope, and methodology section could both enhance the usefulness of EIA's products and more clearly define and establish EIA's responsibilities, role, independence, and objectivity.

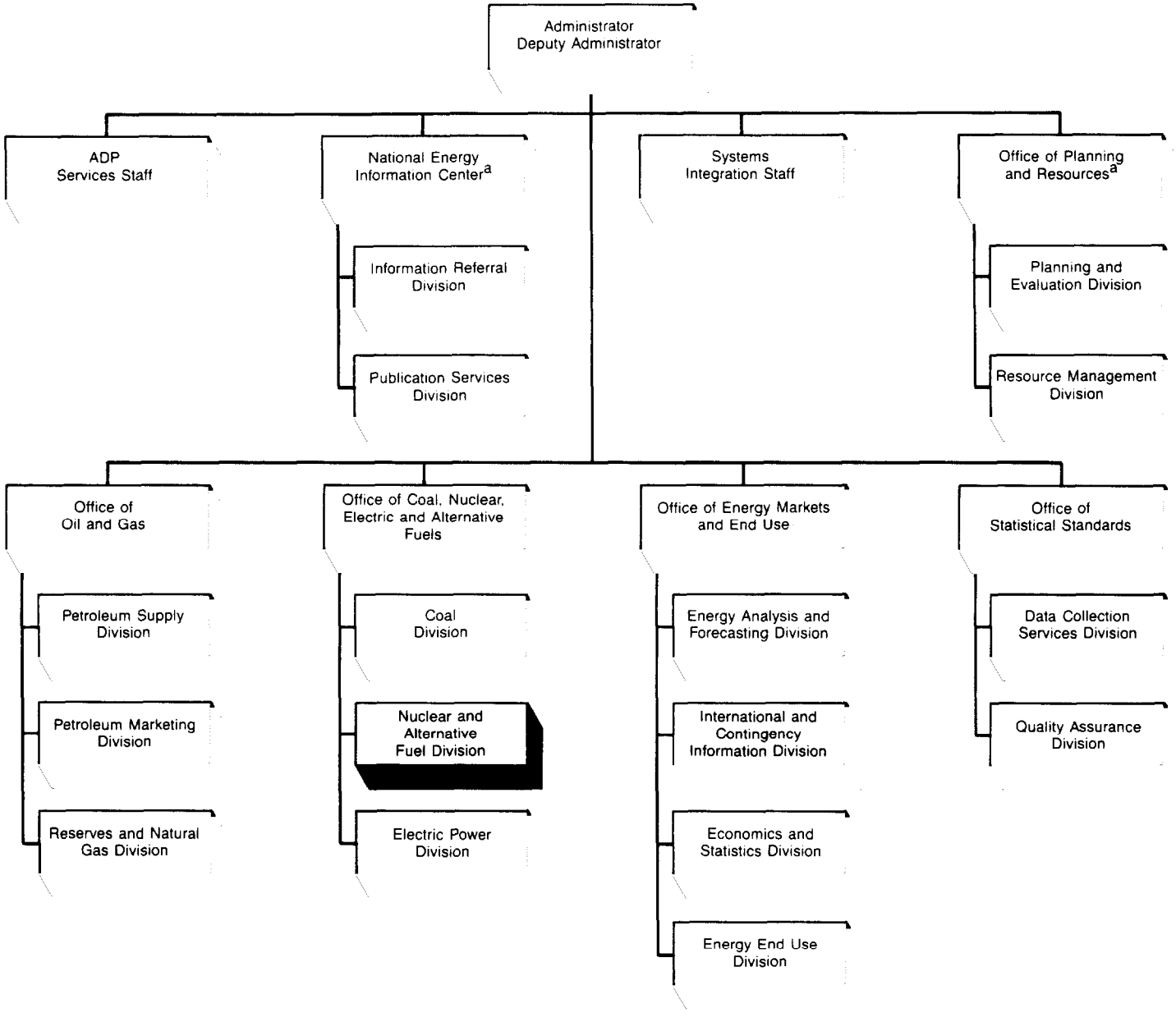
AGENCY COMMENTS

The draft of this report provided to EIA for comment contained a recommendation that it evaluate the operation of the service request tracking system including program office compliance with it. In its comments, EIA stated that it did not consider a full audit necessary. In subsequent discussions with EIA officials, we were informed that the evaluation EIA originally planned had been reduced in scope because the portion performed had disclosed only minor problems, and they did not believe a full audit as planned was necessary. As the officials are satisfied with the coverage that has been achieved and they told us that corrective action will be taken on what they characterized as minor problems, completing the evaluation originally planned does not seem necessary at this time.

Our draft report also contained three recommendations for strengthening requirements on disclosing EIA's role in service reports, better informing report users of the report preparation process, and using a scope and methodology section in reports. In its comments, EIA expressed general agreement and indicated that some revisions were made and others were under consideration. Subsequently on March 8, 1988, EIA issued an amendment to its internal guidelines that provided for the implementation of these three recommendations.

APPENDIX I

Organization Chart Energy Information Administration



As of August 1985
Source: EIA.

[a]Effective May 24, 1987, the National Energy Information Center and the Office of Planning and Resources were combined under one office—the Office of Planning, Management, and Information Services.

APPENDIX II

ADVANCE COMMENTS FROM THE ENERGY INFORMATION ADMINISTRATION

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

Department of Energy
Washington, DC 20585

OCT 23 1987

Mr. James Duffus, III
Chairman, Professional Audit Review Team
441 G Street, NW
Washington, DC 20548

Dear Mr. Duffus:

Thank you for the opportunity to comment on the draft Professional Audit Review Team (PART) "Performance Evaluation of the Energy Information Administration (EIA)." After careful review of that report, we find serious problems in the interpretation and representation of facts related to EIA's quality program. Due to the unexpected extent of these discrepancies, we feel compelled to respond in detail to the report.

I would first like to address several of the more significant issues in the PART report and then comment on the recommendations.

Quality Program and Expenditures

A fundamental error in the PART report is the failure to recognize that "quality maintenance investments" (QMI's) are only a small subset of the overall EIA quality control program. While Chapter 2 of the report reasonably describes the major elements of EIA's quality program (i.e., quality control, quality assurance), the report proceeds to focus on QMI's, and the expenditures thereon, as the total measure of EIA's quality control activities. This is not only incorrect, but extremely misleading.

As the report notes, the quality control function is performed by the EIA program offices. However, quality control is much broader than the narrow definition of projects that will be funded as QMI's. The performance of the quality control function is an integral part of the many activities necessary to run the day-to-day operation of our data systems and analysis programs. These routine quality control functions for all EIA data systems include a broad spectrum of statistical activities that are continually underway. These ongoing quality control activities include: selection of efficient samples; refinement of control procedures for mail and personal interview surveys; development

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of an optimal mix of manual and computerized screening of completed questionnaires; ongoing programs for control of errors in computerized data entry; continued implementation and refinement of computer-generated edits and subsequent resolution of flags; field visits and meetings with respondents to discuss reporting issues; monitoring of response rates with procedures developed for insuring high rates; imputation of missing data with continued refinement of imputation procedures. In addition, the EIA program offices have moved to insure that all publications include documentation of data sources, as well as presentation of sampling errors where appropriate. Since 1986, routine functions have also included maintaining the system documentation and keeping the sampling frame up to date. These activities which represent a major portion of EIA's expenditures are not reflected in the QMI budget but in the operating budget for the systems.

Since the quality control function is an integral and ongoing part of the operation of EIA data systems, it is neither practical nor desirable to account for these costs separately. For example, for each data system a number of employees, both Government and contractor, are involved in the operation and each spends a portion of their time in some aspect of quality control. To account for quality control separately would involve a massive paperwork exercise, and at best a guess on the part of each person regarding what portion of their time was spent on quality control. We do not believe the benefits derived from such an effort would justify the additional administrative burden and costs.

EIA continues to believe that a strong quality control effort by the program offices must be our first-line effort at maintaining and improving the quality of EIA data. The program office personnel are most knowledgeable of the operating systems and models and of the changes or trends that are occurring in the industries being surveyed or analyzed. In addition to the routine quality control functions, the program offices initiate many systems improvements based on their extensive knowledge of the systems, their strengths, weaknesses, reliability, and performance over time. The PART report leaves the impression that operating systems are only evaluated during quality audits. This is not the case since evaluations occur continuously during the performance of quality control functions by the program offices. Quality audits are complementary to the quality control function; they are intended to assure that the quality control function is being performed properly, and to identify further improvements which could be made, based on an independent review.

The PART report states that EIA "had no assurance that its quality control is adequate" and continues to recommend that we assess the adequacy of our quality program. We believe we have done this through a combination of our Multi-year Operating Planning (MOP) process and the Office of Statistical Standards' (OSS) quality assurance activities. The MOP is a bottom-up process whereby the program offices and their specialists most

familiar with the data systems and models develop funding requirements for continued operations or new developments, including quality control, which is an integral part of the operations. Both the program office and the OSS identify new quality control activities and quality maintenance investment projects that need to be implemented. The OSS also identifies its quality assurance requirements. Overall quality program needs and priorities are thus identified through this process. For example, in the FY 1988 budget evolving from the MOP, the number of quality audits was increased from 8 to 11 based on this assessment, a point not mentioned in the PART report.

It must be recognized that the MOP process, which supports our budget, is prospective and takes place approximately 1½ years before funding is actually received. Due to this time lag, flexibility is essential to adjust the programs to meet new priorities or new problems. For example, the OSS programs such as quality audits, the annual State-of-the-Data Report, and independent expert reviews identify current program needs. Such information is used to update and revise the MOP annually and to develop the Annual Operating Plan (AOP) which is used to execute the budget. There is a regimented system for documenting changes to both the MOP and AOP.

The draft PART report states that "the accounting system data (for quality funding) could be overstated by about as much as 40 percent for fiscal year 1987 and about 27 percent for fiscal year 1988." Contrary to the implication of this statement, and measured on a consistent basis, EIA has not shifted funds away from the quality budgets as presented to the Congress and, in fact, has increased funding (see Enclosure 1).

See comment 1.

In summary, Chapter 2 of the PART report erroneously refers to funding designated for the narrowly defined area of "quality maintenance investments" as the total EIA quality control budget or expenditures. Thus, our expenditures and activities on quality are significantly understated because the substantial quality control efforts performed by the program offices, not meeting the narrow definition of QMI's, are excluded.

The expenditures on QMI's in and of themselves are an extremely poor measure of EIA's quality efforts for several other reasons. First, it should not be expected that QMI funding would remain level over time. As the backlog is worked off, funding levels will decrease, or increases may occur in future years if additional problems or deficiencies are identified. Second, QMI's for certain categories were only intended as a one-time effort. For example, several years ago it was recognized that a significant effort was required on model documentation and this was budgeted under the QMI category. However, once the documentation for existing systems was completed, funding for revisions to that documentation or documentation for any new system was routinely shifted to the program office's operating budget. Thus, now that the backlog of model documentation has been eliminated,

additional QMI funding will not be identified for this category, leading to a natural decrease in total QMI funding. Because of the changes in definitions and the one-time nature of some QMI projects, the data in Figures 2.1 and 2.2 of the draft report are "apples and oranges" comparisons which, in fact, cannot be replicated.

Documentation

PART's summary conclusion on documentation is that EIA "had uncertain knowledge of the adequacy of the documentation of its models and data systems." This statement, while being extremely vague, is totally unjustified by the facts.

The process of examining documentation essentially involves three steps:

1. Does the documentation exist?
2. Does it contain all the appropriate items or relevant information?
3. Does the data system adequately and accurately reflect the processing system or does the model have a good economic and/or statistical basis?

The PART report does not accurately reflect the progress made on this process. As the PART report indicates, all EIA models have been documented except one which is still under development. All three of the examination steps have been completed for the models. The assessment of adequacy (step 3) has been carried out by in-house analysts or by independent outside experts.

All models are archived and publicly available, as is the documentation. Thus, any member of the public can reproduce any of EIA's published forecasts. We feel this is a significant accomplishment. While we have recently initiated a model quality audit program which will include further evaluation of the models, at this point a comprehensive review of the documentation has been completed, contrary to PART's assertion.

With respect to documentation of data systems PART has confused two issues: (1) the provision of adequate documentation of statistical reports at the time of publication to meet the legislative requirements, and (2) the completion of documentation to EIA standards for the data processing systems.

The EIA statistical publications include adequate documentation to advise the users of the basis and limitations of the statistical information. This documentation is included in the report or supplemental publications available to the public. This includes a description of the survey, sample design, frame, sampling errors, definition of terms, etc.

The documentation of the operating systems to EIA standards is for internal use in operating the systems and to provide

continuity through personnel turnover. With respect to this documentation, the first two steps of the examination process discussed above have been completed for all but 13 of the 66 systems, and a schedule has been developed for review of the remaining systems. The third step is completed during quality audits, which have currently been completed on 48 of the 87 surveys. We agree with PART that continued effort is required in verifying the adequacy of documentation for the remaining data systems.

Quality Audit Findings

The PART report engages in a purely quantitative presentation of our internal audit findings and the status of implementing recommendations. The report makes no effort to qualitatively assess the significance of the findings on EIA data. This leaves the impression that substantial problems exist in the systems audited and, potentially, with the data produced from these systems. This is incorrect.

In conducting a quality audit, the OSS uses a checklist of approximately 100 items. Clearly some of these items are critical or fundamental to the integrity of the system while many are of lesser importance. A simple numerical presentation fails to capture this distinction. Based on discussions with the Director, Office of Statistical Standards, the vast majority of the findings fall into the noncritical categories of enhancements or improvements. In those limited instances where critical items have been identified which could have a significant effect on the integrity of the data, a high priority was placed on their rapid resolution.

See comment 2.

An example of the misrepresentation of data is on page 26 where citing an EIA contractor's report, the status of 42 recommendations from EIA's quality audits is presented. The PART report states that 19 of these audit recommendations have been fully implemented; but the contractor's report says that 25 have been fully implemented. The PART report states that 13 have been partly implemented; but the contractor's report lists 2. The PART report states that 6 have not been implemented; but the contractor's report says just 3 have not been implemented. The statement is then made "The net result was that from 1½ to 2½ years after the recommendations were made, about half of them had not been fully implemented." In fact, not only had 60 percent been fully implemented, with an additional 17 percent still in the process of being implemented (for a total of almost 77 percent), but the report fails to state anything about why the remainder were not. Several were not and will not be implemented by conscious choice, because they were rejected as invalid. This was noted in the cited report. Of the 37 recommendations accepted, all but 3 were implemented or were being implemented, a rate of 92 percent.

See comment 3.

Recommendations

(1) PART recommends "that the Administrator...[a]ssess the adequacy of current quality control activities with emphasis on the scope and frequency of these activities. Once the appropriate scope and frequency of quality control are determined, EIA should estimate the staffing and resources needed to carry out the program."

As previously discussed, we currently do this through our Multiyear Operating Plan (MOP) and the quality assurance activities of OSS. Through this process we continuously assess the adequacy of quality control activities. We believe our activities are adequate, proper, and often advanced beyond what is done in similar statistical organizations. Our budget requests to Congress each year have included sufficient resources to carry out an effective and efficient quality control program. We have no plans to reduce or modify our current concerns or efforts in this regard.

(2) PART recommends "that the Administrator...[t]ake the necessary steps to provide more precise financial data on the quality control program."

We do not believe it is necessary or appropriate to change our accounting system to capture the level of detail suggested by PART since the costs would outweigh the benefits, a violation of a fundamental principle of any internal control system. At the program office level, quality control is inextricably intertwined with routine operational procedures. It is neither desirable or practical to effect an artificial and necessarily judgmental separation of the costs associated with each.

(3) PART recommends "that the Administrator provide that whenever curtailments in EIA's quality programs could significantly affect the data and analyses in a report, this fact be disclosed. This could be done through (1) providing in each affected published product an explanation of any possible significant effects on the reliability of the product's data and analyses, and (2) providing in EIA's annual report to the Congress the overall possible significant effects on product reliability."

We do not publish data or analyses for which we are not willing to stand by the quality. This is precisely the practice we have always maintained and will continue to maintain. Any EIA report which would require a statement qualifying its reliability should simply not be published, and that is the policy we will continue to follow.

(4) PART recommends "that the Administrator...[s]ystematically plan and carry out quality audits of EIA's data collection activities. In determining the audit priorities of the various forms and the frequency that each should be audited, adequate consideration and priority should also be given to factors relating to (1) the importance of the data collected by each form in the overall scheme of things, and (2) existing knowledge of the stability and reliability of each data base. Such factors could include the national security implications of the data in the form, use of and reliance on the data by a wide audience, the frequency of fluctuations in the data base, and known or suspected problems in the data base."

In our response to the last PART report we noted "...the selection of data collection forms to be covered by the quality audits was carefully planned each fiscal year" and "...the selection is made considering coverage of all program offices and all fuel areas, the importance of the survey, the frequency of form modifications, and the resources the program office has invested in the survey." PART had suggested, however, that we should have a long-range plan for auditing all systems. In an effort to be responsive to the PART recommendation, the OSS did review this matter and concluded that the cost and respondent burden were a good measure of the importance of the surveys and used this for the basis of the longrange plan. We do not expect this plan to be rigid, and will reevaluate it before proceeding annually to consider factors such as PART has suggested. We do agree that all surveys are not of
See comment 4.
equal importance which is reflected by the fact that some surveys have already been audited more than once.

(5) PART recommends "that the Administrator...[e]stablish a formal followup system to assure that quality audit recommendations are implemented in a timely manner."

EIA agrees with the recommendation and has implemented a formal followup system. We should mention, furthermore, that the OSS, earlier this year, did perform a complete review of quality audit recommendations for the Administrator which concluded that only two significant recommendations required quality investment funding, and that funding
See comment 5.
was provided thereafter.

(6) PART recommends "that the Administrator...[e]nsure the prompt completion of EIA's evaluation of whether documentation meeting its standards exists for data collection systems. If data systems are found to lack documentation, a plan should be established for completion of the required documentation, setting target dates and establishing responsibility for its preparation and completion."

Documentation exists for all 66 data systems and the documentation has been checked for completeness for all but 13 systems, all of which have been scheduled for review. A plan and schedule will be developed for preparing and updating documentation found to be incomplete during this review. Furthermore, documentation is evaluated for accuracy when quality audits are performed. EIA currently does comply with legislative requirements for documentation.

(7) PART recommends "that the Administrator...[h]ave documentation promptly completed for the one model which lacks it."

Documentation for this one model, which is still under development, will be completed subsequent to the revision of the model and prior to the publication of any report based upon it.

(8) PART recommends that "the Administrator should enforce and revise EIA's April 1984 policy relating to model and data systems documentation [and that]...the policy should be...[e]nforced with respect to the provisions that no EIA reports should be issued unless the models and data collection systems on which they are based are documented to EIA standards...[and r]evised to require an evaluation of the adequacy of the documentation."

It clearly remains our goal to have all models and data systems documented to EIA standards. As discussed above, all analytic reports are based on documented models and model results are archived and publicly available. The documentation of models has been reviewed for adequacy and compliance with EIA standards, which is routinely accomplished through our internal review process and outside independent reviews.

Documentation exists for all EIA data systems. Review for adequacy and compliance with EIA standards is accomplished during quality audits which have been completed on over half of the systems. It must be recognized that this documentation is for internal use in operating the data processing systems. The EIA statistical publications include adequate documentation to advise the users of the basis and coverage of the data.

(9) PART recommends "that the Administrator...establish a program to evaluate systematically the adequacy of model documentation. The program should include a specified schedule for conducting the evaluations."

All models have been fully documented except one that is still being developed. The adequacy of model documentation has been verified by in-house and independent reviews performed over the last several years.

(10) PART recommends "that the Administrator undertake an evaluation of the operation of the service request tracking system and program offices compliance with it."

A full audit as suggested by PART is not considered necessary. The review that was performed indicated minor problems with the existing policy and procedure, which EIA will be correcting with appropriate revisions to its directive. The review performed was sufficient to indicate that no serious problems exist with regard to the adequacy of tracking because all items were tracked in a manner which received adequate high-level attention. Changes currently being considered for the handling of Service Reports will appropriately ensure tracking and control. We would expect to perform sample audits in the future and advise program offices of noncompliance and corrective actions needed.

(11) PART recommends "that the Administrator...[r]evise EIA's internal guidance to strengthen the requirements for disclosing EIA's role in service reports."

EIA has recently implemented several changes in the format of Service Reports which we believe address recommendations 11 through 13. The preface will now indicate the requester of the report, the scope of the study request, and assumptions provided by the requester (or where they may be located in the report), and any other helpful information. An example of the revised format is provided in Enclosure 2.

(12) PART recommends "that the Administrator...[r]equire that the disclaimer on the cover of EIA service reports more clearly express the review process used in preparing the report."

EIA has already changed its disclaimer statement (see Enclosure 2). The following statement now appears on EIA Service Reports:

> Service Reports are prepared by EIA upon special request and may be based on assumptions specified by the requester. Information regarding the request for this report is included in the Preface.

(13) PART recommends "that the Administrator...[r]equire that a section be included in all EIA reports explaining the applicable review process as well as detailing the scope and methodology used for the report."

Under our revised procedures the extent of review within EIA will be disclosed in the preface of analytic reports (see Enclosure 2). EIA has always gone to considerable effort to fully document the assumptions, data sources, and models used in all of our reports. However, this information may

not have been uniformly placed in a separate section. We will review the feasibility of doing this.

In conclusion, I must point out one additional concern. During the preparation of this report, to the best of my knowledge, PART staff did not meet with any of the senior managers within EIA (i.e., office directors or Deputy Administrator). Discussion with program office staff was also limited or nonexistent. In short, the draft PART report seems to be based on an administrative review of our internal audits and accounting records and limited discussions with staff of the OSS and the OPMIS. I firmly believe that contacts with our senior managers could have avoided many of the errors and misrepresentations in the report, and I strongly urge that this occur in the future.

I would hope that the final PART report accurately reflects the results, status, and scope of our quality program efforts. Due to the importance of our comments on the draft report, I feel it is essential for me to meet with the PART members before the report is finalized. I will be contacting you to arrange such a meeting.

Sincerely,

H. A. Merklein

Dr. H. A. Merklein
Administrator
Energy Information Administration

Enclosures

cc:
PART Members

ENCLOSURE 1

ENERGY INFORMATION ADMINISTRATION
QUALITY CONTRACT BUDGET HISTORY 1/
($ in millions)

FISCAL YEAR	REQUEST TO OMB	REQUEST TO CONGRESS	APPROPRIATION	FINAL AOP 9/30/87 3/
84	5.2	.3	1.3	1.3
85	3.0	3.0	4.0	4.9
86	3.0	2.5	2.3 2/	2.8
See comment 6. 87	1.7	1.7	1.7	2.9
TOTAL 84-87	12.9	7.5	9.3	11.9

1/ The funds are contract funds only. In addition there are about 40 FTEs, with a cost of about $2.4 million in salaries and support, who work primarily on quality programs.
2/ Actual appropriation included $2.5 million; Gramm-Rudman impact reduced it to $2.3 million.
3/ Total funds tasked in all those AOP codes identified as being quality under the definition in place before 1987. Final AOP is larger than appropriation because of priority placed on funding quality efforts during execution.

EIA **Service Report**

Energy Information Administration
U.S. Department of Energy
Washington, DC 20585

SR/EPD/87-01

ENCLOSURE 2

Opportunities for Using Coal to Replace Imported Energy in Electric Utilities

September 1987

Service Reports are prepared by EIA upon special request and may be based on assumptions specified by the requestor. Information regarding the request for this report is included in the Preface.

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Preface

This study was undertaken at the request of the Deputy Assistant Secretary for Fossil Energy. The purpose of this study is to analyze the potential opportunities to replace imported energy with domestically produced coal. This study is based on results from the Intermediate Future Forecasting System, using assumptions provided by the Office of Fossil Energy. These assumptions are described in the section titled "Assumptions." The report was prepared and reviewed by the Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Contacts

Questions about the scope, methods, or analysis results should be directed to either Robert T. Eynon (202/586-9850) or Jeffrey Jones (202/586-1603).

Assumptions

In general, the assumptions used in the Annual Energy Outlook 1986 have been included in this analysis. However, several assumptions were specified by the Office of Fossil Energy. These assumptions are as follows:

World Oil Prices

Two different paths for world oil prices have been used in this analysis. In the base case, the world oil price is assumed to increase from $20.00 per barrel in 1987, to $26.61 by 1995, and reach $32.87 in 2000 (1986 dollars). In the high-oil-price case, prices rise to $36.75 in 1995 and $40.00 in 2000. The yearly prices are shown below.

World Oil Price

(1986 dollars per barrel)

Case	1987	1988	1989	1990	1991	1992	1993	1994	1995	2000
Base	20.00	21.00	21.72	22.47	23.24	24.04	24.87	25.73	26.61	32.87
High Price	20.00	21.00	23.00	25.00	27.00	29.15	31.50	34.00	36.75	40.00

Canadian Natural Gas Imports

The quantities of natural gas imported from Canada are assumed to be 1.1 trillion cubic feet through 1990, and increase to 1.9 trillion cubic feet in 2000. These levels represent an annual growth rate of about 6 percent between 1990 and 2000. Canadian natural gas is assumed to be priced competitively in the markets which are served, with the price level being determined by the national market clearing price and the weighted average cost of natural gas for each pipeline.

Natural Gas Contracts

A generic implementation of the Federal Energy Regulatory Commission Order 436 and Order 451 is assumed for this analysis. Contract prices are assumed to be equally flexible in both the downward and upward directions. New contracts are assumed to have market-responsive pricing provisions with frequent redetermination of prices.

Domestic Oil Production

Production levels of petroleum for 1987 and 1988 have been assumed to be consistent with those projected in the July 1987 Short Term Energy Outlook[3] and the revised world oil prices.

3] Energy Information Administration, Short Term Energy Outlook, DOE/EIA-0202(87/3Q) (Washington, DC, July 1987)

Beaufort Sea Oil

Near-shore production of oil in the Beaufort Sea is assumed to begin in 1995 and reach 200 thousand barrels per day by 2000.

Capital Structure of Electric Utilities

The financial structure of electric utilities is assumed to be 45 percent debt, 10 percent preferred equity, and 45 percent common equity.

Construction Work in Progress

The current regulatory practice of including a portion of construction work in progress (CWIP) in the rate base is assumed to be phased out over time. The 20-percent national average allowance of CWIP in the rate base in 1985 is assumed to decline uniformly and reach zero by 1995.

Capital Costs for Combined Cycle Plants

Combined cycle plants (fueled by natural gas) are assumed to cost $600 per kilowatt (1986 dollars) based on the currently available technology. Plants are assumed to be 250 megawatts and require a total of 5 years to be licensed and constructed. The fixed and variable components of operating and maintenance costs are assumed to be $9 per kilowatt per year and 1.1 mills per kilowatthour, respectively.

Construction Expenditure Profile for Coal-Fired Plants

The construction period for coal-fired plants is assumed to require a total of 8 years, including licensing approvals. Construction outlays for coal-fired plants are assumed to be 0.0, 1.0, 3.0, 11.0, 14.0, 33.0, 34.0 and 4.0 percent, respectively, for years 1 through 8. The cost of coal-fired plants is assumed to be about $1200 per kilowatt (before interest charges) and vary by location, Btu content, and sulfur content for a 500-megawatt plant. The operating and maintenance costs vary by Btu content and sulfur content of the coal burned. The fixed portion is assumed to range from $29 to $32 per kilowatt per year and the variable portion from 1.0 to 2.9 mills per kilowatthour.

Capital Costs for Life Extension

The capital cost for life extension of coal-fired plants is assumed to be $150 per kilowatt (1986 dollars). Life-extension investments are made beginning in 1990 for plants that are 25 years old and 100 megawatts or larger. For oil- and gas-fired steam plants, the capital cost is assumed to be $100 per kilowatt. The increase in operating and maintenance costs (excluding fuel costs) with life extension are assumed to be $10 per kilowatt per year. About 174 gigawatts of coal-fired steam plants and about 87 gigawatts of oil- and gas-fired steam plants are assumed to have life-extension programs.

Generating Capacity Additions

Revised schedules for completion of new generating plants have been included. These revisions reflect assessments made of the current status of construction projects and judgments about whether completion dates provided by utilities can be achieved.

Planned Capacity Additions
1985 - 2000

Fuel Type	Gigawatts
Coal	39.5
Other Fossil Fuels	2.1
Nuclear	36.5
Turbines	3.8
Other*	10.6
Total	92.5

*Other includes conventional and pumped storage hydroelectric power and other sources such as geothermal power, wood, solar, and wind.

Coal/Water Mixtures

About 4 gigawatts of coal-capable capacity currently using oil and 18 gigawatts of oil-fired capacity are assumed to be converted to coal/water mixtures in the "coal/water mixtures" scenario. Conversions are assumed to require 5 years and would be completed in 1992 at a cost of $250 per kilowatt (1986 dollars), assuming that the decisions to convert are made now. Capacities for plants that are not coal capable are derated by 25 percent to account for the combustion space requirements when coal is used. The total capacity using coal/water mixtures after derating is about 18 gigawatts. The cost of preparation of coal/water mixtures is assumed to be $0.75 per million Btu above the delivered cost of coal. In addition, a 30-percent increase in transportation costs for coal is included to account for the additional moisture content and resulting weight of coal/water mixtures. Finally, the operating and maintenance costs are assumed to be 100 percent more than for oil-fired plants, based on estimates derived from tests conducted at some plants.

Results

The results for each of the scenarios are described below. The regions included in this analysis are described in Appendix A. The results for the cases analyzed are provided in Appendix B through Appendix H. These appendices include national and regional information.

The following PART comments on the Energy Information Administration's letter dated October 23, 1987, supplement those in the report text.

PART COMMENTS

1. The quote in the first sentence of this paragraph has been taken out of context. The context of the quoted material was that before fiscal year 1987, OSS did an independent analysis of the quality maintenance investment budget but that beginning with fiscal year 1987 EIA was relying completely on data in the accounting system. PART's analysis indicated that some of the same projects eliminated in part or in whole by OSS as not quality in fiscal year 1986, appear in the fiscal year 1987 and 1988 budgets. We concluded that if OSS were to have similar conclusions on these projects, the accounting system data could be overstated by as much as the percentages noted in chapter 2.

2. Concerning how critical quality audit findings were, a substantial amount of noncompliance with several quality standards was disclosed in recent quality audits. The areas of noncompliance included three cited by EIA as important—frames development, frames maintenance and performance statistics. In addition to the quality audit checklist, an EIA standards checklist is also completed as part of each quality audit. Each of the 21 standards in the checklist is divided into two or more requirements, with a total of 142 requirements for the 21 standards. The checklist provided three categories of compliance—complete, partial, or no compliance—and not applicable.

We reviewed 11 quality audits issued from November 1985 through June 1987 and noted the following in two important frames areas

- in the frames development area, 2 audits indicated complete noncompliance with all the standard's requirements, and 3 audits indicated complete compliance with only half or less of the requirements; and
- in the frames maintenance area, 6 audits indicated complete compliance with only half or less of the requirements.

In a September 1984 memo to the Administrator commenting on alternatives for allocating quality control investment funds, the Director of OSS stated

> *"Performance statistics are the day-to-day indicators of the reliability of the products from a data system or model. Performance statistics provide a measure of quality . . . and also a tool that can be used as an early warning system to detect when a problem is developing, . . .*
>
> *Documentation, frames and performance statistics are considered basic quality control activities because the other quality control activities are either ineffective, inefficient, or impossible, unless the basic controls have been implemented."*

Despite the importance cited for performance statistics, in the eight quality audits issued from January 1986 through June 1987 where compliance with the performance statistics standard was measured, there was substantial noncompliance with the standard. In two audits there was no compliance with any of the standard's requirements, and in the remaining six audits there was complete compliance with less than half of the requirements.

3. We compiled data on the status of the recommendations from the detail narrative on each audit recommendation. We noted at the time that in several instances this differed from classifications indicated by the report's summary table.

Subsequent to these comments, EIA staff and the contractor reviewed the contractor's report and concluded that the summary table adequately captured the responses to the recommendations. EIA stated that a few recommendations were classed as fully implemented although some minor components were still being implemented. EIA concluded that the assignment of categories requires judgment as to whether the intent of the recommendations was satisfied.

Regardless of whether one accepts the status of the recommendations indicated either by the summary table used by EIA or the report's narrative used by PART, from 1½ to 2½ years after the recommendations were made a number were not fully implemented. We believe that either set of data supports the need for a follow-up system.

4. Based on a previous interview of an OSS staff member and other documentation in our files, it would appear that second audits of EIA surveys were performed because of the limited scope of the original 1983 quality audits rather than any considerations about the importance of these surveys. Two systems, consisting of eight surveys, have been audited twice. We were previously told by the OSS staff person formerly in charge of quality audits that the surveys audited twice were those audited in 1983 before the present form of quality audit evolved. For example, one system that was audited a second time in 1986 consisted of seven surveys, and the 1983 audit of this system was limited to its compliance with EIA quality standards.

5. The followup consisted of asking each program office director if there were any outstanding quality audit recommendations requiring quality investment funding for implementation. In addition, the Director, OSS, subsequently informed us that the two recommendations requiring quality investment funding were not quality audit recommendations.

6. The budget includes funding for the quality maintenance investment program and for OSS programs. Our discussion in chapter 2 includes only the quality maintenance portion of these budgets and was based on quality contract budget data previously given to us by EIA. The prior data agrees with the above data with the exception of fiscal year 1987. The data show a quality contract budget of $2.9 million for fiscal year 1987 while the prior data show $2.1 million, an increase of $800,000. About $700,000 of the increase was in the quality maintenance investment program.