

DOE/IG-0486

AUDIT
REPORT

FEDERAL ENERGY REGULATORY
COMMISSION'S DAM SAFETY
PROGRAM



October 2000

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

October 27, 2000

MEMORANDUM FOR THE CHAIRMAN, FEDERAL ENERGY REGULATORY
COMMISSION

FROM: Gregory H. Friedman (Signed)
Inspector General

SUBJECT: INFORMATION: Audit Report on "Federal Energy Regulatory Commission's
Dam Safety Program"

BACKGROUND

Under the Federal Power Act, as amended, the Federal Energy Regulatory Commission (Commission) is responsible for ensuring that over 2,500 non-Federal hydroelectric dams under its jurisdiction are properly constructed, operated and maintained. To determine whether the dams' physical structures are maintained in a safe manner to protect the public, the Commission performs onsite inspections to identify evidence of damage or other conditions that could impair proper project operation or violate license requirements.

High and significant hazard dams are scheduled to be inspected annually by the Commission each year and once every 5 years by independent consultants. These dams are inspected at such frequency because failure of the dam structures could result in loss of human life, economic loss, environmental damage, or disruption of facilities. The remaining dams, which have a low risk that failure would result in such loss, are inspected every 3 years. When independent consultants perform the inspections, Commission engineers are required to assess the scope and adequacy of the inspections.

We audited the Commission's dam safety program to determine if the goals of the program were being met. More specifically, the audit focused on whether the Division of Dam Safety and Inspections was conducting inspections, including reporting results and tracking follow-up actions.

RESULTS OF AUDIT

In Fiscal Year 1999 the Commission conducted inspections at over 900 high and significant hazard dams. The Commission also used management systems to track key information requirements and actions, and information reviewed during the course of the audit was generally found to be accurate and complete. However, improvements were needed in the review of independent consultant reports and the processing of internal reports relating to the inspection of dams.

As of spring 2000, the Commission had not comprehensively reviewed over 70 independent consultant reports and had not prepared final reports of more than 300 internal inspections, some of which had been performed in 1997. This situation existed because management had not fully monitored regional office performance or established report issuance as a priority or a

measure of performance. As a result, the Commission did not have complete, timely, and important information about the safety condition of some dams under its jurisdiction. Further, inspection results were susceptible to misunderstanding since they had not been finalized and were not available for management review and public accountability. The attached report recommends that the Commission develop a plan to address the backlog and improve its monitoring of inspection reports.

MANAGEMENT REACTION

Your office concurred with the audit finding and recommendations. A comprehensive plan will be developed to reduce or eliminate the backlog of consultant reviews and preparation of internal inspection reports. In response to the audit, your office also modified the Data and Management System database to improve monitoring of the report issuance process and will include the issuance of inspection reports as a part of assessing overall performance.

We consider the proposed corrective actions, if fully implemented, responsive to the audit recommendations. Appendix 2 of the attached report includes verbatim the Office of Energy Projects' comments.

Attachment

cc: The Secretary of Energy
Director, Office of Energy Projects, FERC

Federal Energy Regulatory Commission's Dam Safety Program

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Overview

INTRODUCTION AND OBJECTIVE

Under the Federal Power Act, as amended, the Federal Energy Regulatory Commission (Commission) is responsible for licensing and regulating over 2,500 non-Federal hydroelectric dams. The Commission's primary responsibility is to ensure that dams under its jurisdiction are properly constructed, operated, and maintained. To determine whether the dams' physical structure is maintained in a safe manner to protect the public, the Commission performs on-site inspections to identify evidence of damage or other conditions that could impair proper project operation or violate license requirements. To maintain organizational and public accountability, the Commission requires that inspection results be documented in a written report.

Over 900 of these non-Federal dams are considered high and significant hazard dams because failure of the dam structures could result in danger of human life, economic loss, environmental damage, or disruption of facilities. These dams are scheduled for inspection annually by the Commission and once every 5 years by independent consultants. Commission guidelines require that staff engineers assess the scope and adequacy of independent consultant inspections. The remaining dams, which have a low risk that failure would result in such loss, are inspected every 3 years.

Responsibility for the Commission's dam safety program has been assigned to the Division of Dam Safety and Inspections. Primary responsibility for the day-to-day conduct of high and low risk inspections has been delegated to the Commission's five regional offices.

The Commission's longstanding dam safety program has been internationally recognized. Other Federal and state agencies responsible for dam safety and compliance view the Commission as a leader in dam safety and believe its procedures meet or exceed currently recognized engineering standards for dam safety. In accordance with the Government Performance and Results Act (GPRA) of 1993, the Commission established measures for the dam safety program that included assuring all high and significant hazard dams were inspected annually and the level of such dams meeting all current structural safety standards was to remain uniformly high.

The objective of the audit was to determine if the goals of the dam safety program were being met. More specifically, the audit focused on whether the Division of Dam Safety and Inspections was conducting inspections, including reporting results and tracking follow-up actions.

**CONCLUSIONS AND
OBSERVATIONS**

In Fiscal Year (FY) 1999, the Commission conducted operation inspections at over 900 high and significant hazard dams and was appropriately tracking needed actions. However, improvements were needed in the review of independent consultant reports and the processing of internal reports.

A review of selected activities at three regional offices showed that inspections to ensure structural soundness and public safety at high and significant hazard dam projects were carried out. Furthermore, the Commission used management information systems to track key requirements and actions, and the information contained in these systems was generally found to be accurate and complete.

However, as of spring 2000, the Commission had not comprehensively reviewed over 70 independent consultant reports and had not prepared final reports of more than 300 internal inspections, some of which had been performed in FY 1997. The backlogs existed because management had not fully monitored regional office performance related to review and reporting or established report issuance as a priority. As a result, the Commission did not have complete, timely, and important information about the safety condition of some dams under its jurisdiction. Further, inspection results were susceptible to misunderstanding since they had not been finalized and were not available for management review and public accountability.

The issues discussed in this audit report should be considered by management when preparing the yearend assurance memorandum on internal controls.

Signed
Office of Inspector General

Dam Safety Program

Consultant and Operational Reports Require Processing

The Commission's Division of Dam Safety and Inspections Operating Manual provides guidelines for validating independent consultant reports as well as conducting and reporting the results of internal inspections. The guidelines require that a qualified independent consultant inspect each high and significant hazard dam every 5 years. These inspections provide an independent assessment of whether there are any current or potential deficiencies in the condition of project structures, quality and adequacy of maintenance, or methods of operation that might endanger public safety. Commission guidelines also require that staff engineers perform both preliminary and detailed reviews of data presented in the independent consultant reports. The preliminary (or cursory) review is designed to identify immediate dam safety concerns that need to be addressed. The more detailed review evaluates, among other things, the consultant's assessment of the structural stability and adequacy of the dams and if the inspection was consistent with Commission design criteria. The detailed review is to be performed within 120 days after receiving the consultant report.

Commission guidelines also require that onsite operation inspections performed by staff engineers be completed with a written report within 60 days. These reports include a discussion of the project's operations and maintenance program, items that need correction, and photographs. These reports also communicate inspection results to licensees and the public and facilitate follow up to determine whether appropriate corrective actions are taken. The reports further provide historical data that should be used to develop trend analyses and aid in the early identification of problems. The need to maintain public accountability and avoid any misunderstanding of inspection results requires that inspection reports be written and completed in a timely manner to be of maximum use to decision makers and stakeholders.

Review and Report Processing Was Not Timely

Three regional offices had not performed required detailed reviews of over 70 independent consultant reports. The purpose of these reviews was to validate the adequacy of the consultants' work and evaluate the appropriateness of recommended actions. These same regional offices had also not prepared the final reports detailing the results of more than 300 internal inspections.

Review of Independent Consultant Reports

As of spring 2000, more than 70 independent consultant reports had not been comprehensively reviewed. While these reviews were to be completed within 120 days after receiving the consultant reports, 34 of these reviews had been delayed for more than 2 years. Table 1 shows the number of independent safety inspections that the three offices had not fully evaluated for adequacy.

Table 1 - Backlog of Detailed Reviews of Independent Consultant Reports
(Year Report Received)

<u>Regional Office</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	<u>Total</u>
Atlanta	1	6	10	17
Chicago	8	15	26	49
San Francisco	<u>0</u>	<u>4</u>	<u>8</u>	<u>12</u>
Total	<u>9</u>	<u>25</u>	<u>44</u>	<u>78</u>

The regional offices audited had, however, performed preliminary or cursory reviews of all independent consultant reports sampled to identify and track immediate dam safety concerns. If no concerns were apparent, the detailed or more in depth evaluation of the consultants' findings was postponed and priority was given to completing inspections of high and significant hazard dams. However, the Commission and stakeholders did not have information on the safety conditions of these dams.

The Atlanta office was 9 months behind schedule in reviewing independent consultant reports. Atlanta officials advised that the delay occurred because of staff limitations. Chicago was 1.5 years behind schedule. Officials from Chicago, which had more than half the backlog, advised that a number of its detailed reviews were awaiting the results of a study on maximum flood levels that had not yet been completed. Data from this study was needed to fully assess consultants' findings.

Unwritten Inspections Reports

A review of selected activities scheduled during FY 1999 for high and significant hazard dams showed that inspections were carried out, and

deficiencies were being tracked. However, the results of more than 300 internal inspections had not been documented in a final report. The problem existed predominantly in the Atlanta office. Table 2 shows the number of unwritten inspection reports that existed at each regional office as of spring 2000.

Table 2 - Unwritten Inspection Reports
(Fiscal Year Inspection Completed)

<u>Regional Office</u>	<u>FY97</u>	<u>FY98</u>	<u>FY99</u>	Total
Atlanta	25	91	171	287
Chicago	0	0	11	11
San Francisco	<u>0</u>	<u>0</u>	<u>24</u>	<u>24</u>
Total	<u>25</u>	<u>91</u>	<u>206</u>	<u>322</u>

On average, FY 1999 reports for Atlanta were more than 7 months past due. According to officials, a backlog of unwritten reports had existed for many years. The backlog at one time included more than 800 unwritten reports, but improvements in management and workload prioritization helped reduce the backlog to 287. The unwritten report backlogs at Chicago and San Francisco were minimal. However, additional staff reductions could result in future backlogs at these sites.

Regional officials advised that even though final inspection reports had not been issued, letters identifying issues needing immediate attention had been sent to licensees. Furthermore, the Commission was tracking corrective actions identified in these letters. While these actions were important, such letters were not a substitute for a final report that, among other things, satisfied the Commission's responsibility to have a formal report available for all stakeholders. More importantly, final reports were needed in succeeding inspections to develop trend analyses and aid in the early identification of problems at dams.

In discussions about the report backlog, Headquarters officials acknowledged the importance of finalizing inspection results with a written report. Officials further stated that eliminating the final report was not a consideration.

Improved Oversight Needed

Headquarters officials who were responsible for the dam safety program were not fully aware of the backlog of reports and did not

have sufficient information to track and monitor regional workloads and ensure that inspection results were reviewed and finalized as required. Furthermore, eliminating workload backlogs related to inspection review and reporting was not a priority.

The Division of Dam Safety and Inspections maintained a database, which contained more than 300 items of information on dams under their cognizance, including the date of each inspection. However, the system did not contain a field that tracked the dates inspection reports were issued or when reviews of independent consultant reports were completed. Consequently, Headquarters officials relied extensively on the regional offices to ensure that workloads, including inspection activities, were completed within required timeframes.

Also, eliminating the backlog of independent consultant reviews and unwritten inspection reports was given a lower priority in the regions. Regional officials advised that because of staffing limitations, workloads were prioritized and attention was given to conducting annual inspections of all high and significant hazard dams. Officials further expressed concern that given recent reductions in engineering staffing it will be difficult to reduce current backlogs or meet the required timeframes in the future.

Although the Division of Dam Safety and Inspections had established a GPRA performance measure for assuring all high and significant hazard dams were inspected annually, the requirement for an issued report was not included as a goal. Such information is important if the commission is to achieve its intended outcome as envisioned by GPRA. This information is also important in identifying areas needing management attention.

**Safety Information Was
Not Fully Available**

Delays in reviewing independent consultant reports could affect the timely identification of dam safety concerns. Furthermore, the Commission and relevant stakeholders did not have timely and complete information on the safety condition at some dams.

Regional officials provided several examples where dam safety concerns were identified as a result of the Commission's detailed reviews of consultant safety inspections. In one example, a detailed review conducted by Commission engineers disclosed that the independent consultant had not used the most current seismic data to assess a dam's stability. In this case, the Commission requested that the safety of the dam be reevaluated using current seismic data. As a result

of the reevaluation, the dam underwent major modification. In another example, a regional office analysis of the independent consultant's inspections disclosed that the study did not adequately assess the stability of the dam's abutment rocks. A detailed evaluation of the dam abutments was subsequently requested. While we were advised that such findings are infrequent, these examples illustrate the importance of conducting timely detailed reviews of independent consultant reports.

Delays in documenting the results of internal inspections also increase the chances that some details of the inspection may be lost, and that the report may not accurately reflect the inspectors' findings. Additionally, failure to complete final reports in a timely manner deprives the public of dam safety information. More importantly, historical information needed to develop trend analysis, which can aid in the early identification and correction of dam safety problems, was not available.

RECOMMENDATIONS

We recommend that the Director, Office of Energy Projects increase oversight and give priority attention to reducing the backlog of independent inspection reports and unwritten internal inspection reports. At a minimum, the Director should:

1. Develop a management plan to reduce the current backlogs in the detailed review of consultant reports and unwritten internal inspection reports. This plan should include definitive milestones, goals, and strategies for achieving this reduction so that GPRA goals can be attained.
2. Modify Headquarters monitoring systems to track regional office milestone dates to include when inspection reports are issued and detailed reviews are completed.
3. Ensure that regional offices have resources to achieve organizational goals related to dam safety, and develop a contingency plan that prioritizes regional activities if needed resources are not received.
4. Include issuance of inspection reports as a performance measure in evaluating the dam safety program.

MANAGEMENT REACTION

In response to our draft report, the Director, Office of Energy Projects, concurred with the finding and recommendations and advised us of

steps initiated to implement the recommendations contained in the report. Specifically, each Regional Director will be required to develop a comprehensive plan to eliminate the current backlog of consultant reviews and the preparation of internal inspection reports. The plans will contain definitive milestones and trackable goals to significantly reduce or eliminate the current backlog over the next fiscal year. With regard to the Data and Management System database, the program has been modified to track completion dates of both internal inspection reports and consultant report reviews. Finally, officials are taking steps to ensure regional offices have resources to achieve organizational goals related to dam safety and include issuance of inspection reports as a part of assessing overall performance.

The Office of Energy Projects' verbatim comments on this report have been included in Appendix 2.

**AUDITOR
COMMENTS**

Management's proposed actions are responsive to the recommendations.

Appendix 1

SCOPE

The audit was performed from November 1999 through September 2000 at the Federal Energy Regulatory Commission in Washington, D.C.; and Atlanta, Chicago, and San Francisco Regional Offices.

METHODOLOGY

To accomplish the audit objective we:

- Reviewed policies and procedures established to accomplish Division of Dam Safety and Inspections goals.
- Interviewed Commission officials at Headquarters concerning dam safety responsibilities, operating manual requirements, and management of workload levels.
- Interviewed field office officials concerning dam safety issues including workload levels, establishing priorities, extent of backlogs, and actions necessary to manage scheduling and tracking systems.
- Accompanied the Commission engineer on two dam safety inspections at the Atlanta Regional Office.
- Reviewed workload systems and products including independent consultant reports, inspection reports, and workload tracking systems.
- Selected a sample of high and significant hazard dams scheduled for inspection during Fiscal Year 1999 and verified that the inspections had been performed.
- Interviewed dam safety officials at the Corps of Engineers, State of Maryland, and the Tennessee Valley Authority.

The audit was conducted in accordance with generally accepted Government auditing standards for performance audits, and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. We reviewed and utilized computer-processed data from several Commission reporting and tracking systems. We performed tests to review the accuracy of this data to the extent necessary to meet our audit objective. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit.

A formal exit conference was waived by the Federal Energy Regulatory Commission's Office of Energy Projects.

Appendix 2


RESPONSE TO AUDIT REPORT

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D. C. 20426

OFFICE OF ENERGY PROJECTS

OCT 10 2000

Memorandum To Phillip L. Holbrook
 Deputy Inspector General for Audit Services

From Daniel Adamson, Director 
 Office of Energy Projects

Subject Draft Report on the FERC Dam Safety Program

Thank you for submitting the draft report of the DOE IG audit of the FERC Dam Safety Program dated September 5, 2000. We have reviewed the draft report, agree with its conclusions, and the appropriateness of the recommendations. The draft report states that the key information and actions for FERC jurisdictional hydropower projects were generally accurate and complete, but it found that improvements were needed in the timeliness of the review of independent consultant's reports and the processing of internal reports.

In the draft report, the DOE IG makes four recommendations on ways to increase headquarter's oversight and give priority to reducing backlog of independent inspection report reviews and preparation of internal inspection (operation) reports. We offer the following proposals to address the findings of the DOE IG audit.

1. "Develop a management plan to reduce backlog in the detailed review of consultant reports and unwritten internal inspection reports. This plan should include definitive milestones, goals, and strategies for achieving this reduction so that GPRA goals can be attained."

With the staff reductions in recent years, management was focused on this issue prior to the audit and we continue the search for new methods and efficiencies to both accomplish our mission and reduce our workload backlog. Improvements in both engineering processes and report writing are in place, but we agree that more needs to be done. Completing the transition from paper reports to electronic media, redesigning Chapter 3 (Operation Inspections) of our Operations Manual, taking advantage of technological advances such as the use of laptop computers in field locations, and exploring a pilot program using palm sized computer technology, all represented increased efficiencies and will assist in reducing the workload backlog.

Currently, each Regional Director is in the process of developing a comprehensive plan to eliminate the current backlog of consultant report reviews and preparation of internal inspection reports. The plan provides for strategies to significantly reduce or eliminate the current backlog with definitive milestones and trackable goals. It is our intention to eliminate the current backlog as quickly as possible, and avoid backlogs in future fiscal years. However, both of these goals are predicated on the availability of sufficient program resources. Program resources will be adjusted to meet workload demands. We intend to finalize the plan by November 15, 2000.

2. "Modify headquarters monitoring systems to track regional office milestones including dates inspection reports are issued and detailed reviews are completed."

Early in fiscal year 2000 the Division of Dam Safety and Inspections (D2SI) modified the existing Data and Management System (DAMS) database program to include a reporting feature to track when inspection reports are completed. This system is in place to track completion of all internal reports of inspection that were performed during fiscal year 2000 and beyond. Tracking of consultant report reviews is also available on the DAMS database.

3. "Ensure regional offices have resources to achieve organizational goals related to dam safety, and develop a contingency plan that prioritizes regional activities if needed resources are not received."

The Regional Directors have each contributed to the development of a 5-year D2SI Staffing Plan program. The need for a 5-year plan was identified in response to the gradual but steady reduction in staffing levels for Commission over the past several years. Our dam safety staffing level has dropped from 150 in FY 1996 to the current level of 126 in FY 2000 (not counting the recent buyouts and retirements).

The 5-year D2SI Staffing Plan considers the eligibility of regional office staff for retirement, acknowledges the need to attract younger staff members, and allows the Regional Director to plan for replacement of key staff members. It is a living plan with revisions made as resources change. The several consecutive years of buy-outs have impacted the program. As a result of the most recent buyout, dated September 22, 2000, D2SI lost seven staff members, all engineers at the GS 14 and 15 levels. The loss of these highly experienced individuals will affect our immediate productivity levels. We will attempt to make this impact temporary by working as diligently as possible in refilling these positions and addressing the training needs of newly-hired staff. The five year staffing plan will be continually coordinated with the management plan to eliminate backlogs. Included in the process will be any necessary changes in priorities of workload as project specific needs and demands are developed.

4. "Include issuance of inspection reports as a performance measure in evaluating the dam safety program."

We will include this element as part of assessing our overall performance.

Appendix 3

GENERAL ACCOUNTING OFFICE REPORT

Electricity Regulation: FERC's Efforts to Monitor and Enforce Hydroelectric Requirements, GAO/RCED-94-162, May 1994. FERC's monitoring procedures and practices were adequate to ensure that nonfederal hydroelectric projects were operating in compliance with its requirements. In addition, FERC's procedures for investigating allegations of noncompliance with license requirements were adequate and generally followed.

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