

# AUDIT REPORT

Follow-up Audit of the Nuclear Regulatory  
Commission's Decommissioning  
Fund Program

OIG-06-A-07 February 6, 2006



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February 6, 2006

MEMORANDUM TO: Luis A. Reyes  
Executive Director for Operations

FROM: Stephen D. Dingbaum/**RA**  
Assistant Inspector General for Audits

SUBJECT: FOLLOW-UP AUDIT OF THE NUCLEAR  
REGULATORY COMMISSION'S  
DECOMMISSIONING FUND PROGRAM  
(OIG-06-A-07)

Attached is the Office of the Inspector General's (OIG) audit report titled, *Follow-up Audit of the Nuclear Regulatory Commission's Decommissioning Fund Program*.

The audit disclosed that:

- Existing program policies need to be strengthened. The Office of Nuclear Reactor Regulation (NRR) cannot verify that there is reasonable assurance that there will be adequate funds for decommissioning nuclear power plants consistent with prudent business practices. Specifically, decommissioning trust fund balances are not verified and the Nuclear Regulatory Commission's (NRC) investment restrictions are limited in scope and applicability.
- Additional management action is needed on two of four prior OIG audit report recommendations regarding quality control and reassessment of the NRC formula used to provide decommissioning funding assurance.

Consequently, there is (1) \$23.3 billion in decommissioning trust funds at risk, (2) increased vulnerability to decommission funding shortfalls, and (3) potential adverse impacts on the reliability of NRR's assessment of licensee financial assurance and the amount of funds needed for decommissioning.

If you have any questions, please call me at 415-5915 or Steven Zane at 415-5912.

Attachment: As stated

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## EXECUTIVE SUMMARY

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### BACKGROUND

The Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation (NRR), provides oversight of licensee decommissioning funding assurance which is intended to provide reasonable assurance that there will be sufficient funds to safely decommission<sup>1</sup> the nuclear reactor(s). The oversight is based on a review by NRR of the biennial decommissioning funding status reports submitted by licensees as required by Title 10 of the Code of Federal Regulations (CFR), Part 50.75(f).<sup>2</sup> NRR compares licensees' estimates of the amounts needed to decommission their plants with expected decommissioning costs using NRC's two-tiered formula<sup>3</sup> found in 10 CFR 50.75(c). If a licensee's estimate meets or exceeds the NRC formula amount, and the projected accumulation of funds as calculated by NRR<sup>4</sup> meets or exceeds the NRC formula amount, the NRC concludes that the licensee has reasonable assurance of decommissioning funding capability.

A prior Office of Inspector General (OIG) audit of this area contained four recommendations to improve the program. The recommendations related to:

- Quality control,
- Reporting requirements,
- Lessons learned, and
- Reassessing the reasonableness of the NRC two-tiered formula.

During this audit, OIG auditors evaluated the reports submitted by licensees in March 2003, on the decommissioning funding status of 104 commercial nuclear reactors, for the reporting period ending December 31, 2002. NRR completed their review of these reports

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<sup>1</sup> 10 CFR 50.2 defines decommissioning as removing a facility or site safely from service and reducing residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license, or release of the property under restricted conditions and termination of the license.

<sup>2</sup> 10 CFR 50.75(f) requires that licensees submit a decommissioning funding status report every two years, which must include seven items that are listed in Appendix C. In addition, licensees must submit this report annually for any plant that is within 5 years of the projected end of its operation or is involved in mergers or acquisitions.

<sup>3</sup> See Appendix B for a complete description of the formula.

<sup>4</sup> NRR reviews the submitted report and performs several complex calculations to determine whether the reported balance in the decommissioning trust fund is sufficient to meet the anticipated cost of decommissioning at the time of permanent cessation of operations.

in September 2004. In March 2005, licensee's submitted decommissioning funding status reports for the period ending December 31, 2004. NRR was conducting their review of the most current reports during the time this audit was conducted. Accordingly, OIG auditors did not evaluate the most current reports.

As of December 31, 2002, the NRC formula projects that \$38.2 billion will be needed for decommissioning the fleet of operating plants at the time of their permanent shutdown dates. Licensees reported having approximately \$23.3 billion in trust fund assets for decommissioning as of December 31, 2002.

### **PURPOSE**

The objectives of this audit were to:

- Identify opportunities for program improvement, and
- Evaluate implementation of the recommendations made in OIG audit report, OIG 99A-16, dated February 1, 2000.

### **RESULTS IN BRIEF**

OIG determined that existing program policies need to be strengthened. NRR cannot verify that there is reasonable assurance that there will be adequate funds for decommissioning nuclear power plants consistent with prudent business practices. Specifically, decommissioning trust fund balances are not verified and NRC's investment restrictions are limited in scope and applicability.

Furthermore, additional management action is needed on two of four prior OIG audit report recommendations as a result of inadequate monitoring/action by management. Opportunities for improvement continue to exist regarding quality control and reassessment of the NRC formula used to provide decommissioning funding assurance.

Consequently, there is (1) \$23.3 billion in decommissioning trust funds at risk, (2) increased vulnerability to decommissioning funding shortfalls, and (3) potential adverse impacts on the reliability of NRR's assessment of licensee financial assurance and the amount of funds needed for decommissioning.

Addressing the recommendations in this report will improve the controls associated with the agency's decommissioning fund program.

## **AGENCY COMMENTS**

At the January 17, 2006, exit conference with agency senior executives, NRC officials generally agreed with the report's findings and recommendations and provided comments that they believe clarify certain sections of the report. In response to those comments, the report was modified as OIG deemed appropriate.

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## **ABBREVIATIONS AND ACRONYMS**

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CFR	Code of Federal Regulations
EDO	Executive Director for Operations
FERC	Federal Energy Regulatory Commission
GAO	Government Accountability Office
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OIG	Office of the Inspector General
PUC	Public Utility Commission
PSC	Public Service Commission
SRP	Standard Review Plan



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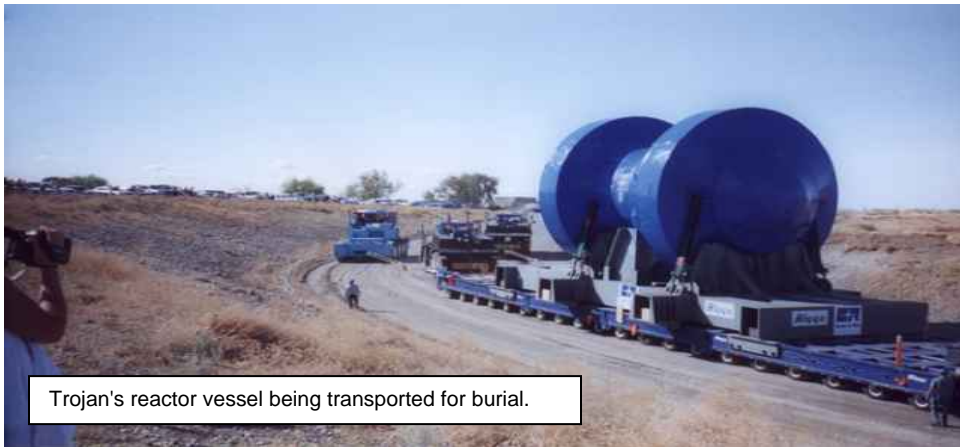
## I. BACKGROUND

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### Decommissioning Funding Assurance

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NRR provides oversight of licensee decommissioning funding assurance which is intended to provide reasonable assurance that at the time a plant permanently ceases operations, there will be sufficient funds to safely decommission<sup>1</sup> the nuclear reactor(s). The oversight is based on a review by NRR of the biennial decommissioning funding status reports submitted by licensees as required by 10 CFR 50.75(f).<sup>2</sup> The reports include: licensee



estimates of the amounts needed to decommission their plants; the amounts accumulated in the decommissioning trust funds to date; and plans to make up the difference between the two, if applicable. NRR compares licensees' estimates of the amounts needed to decommission their plants with expected decommissioning costs using NRC's two-tiered formula<sup>3</sup> found in 10 CFR 50.75(c). If a licensee's estimate meets or exceeds the NRC formula amount, and the projected accumulation of funds as calculated by NRR<sup>4</sup> meets or exceeds the NRC formula amount, the licensee is considered to have reasonable assurance of decommissioning funding capability.

### Existing Regulations

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Licensees refer to 10 CFR 50.75 for requirements on how to provide reasonable assurance to NRC that sufficient funds will be available for the decommissioning process. The financial assurance standards in 10 CFR 50.75(e) are intended to show how certain financing options provide reasonable assurance that adequate funds will be available to pay decommissioning costs.

During this audit, OIG auditors evaluated the reports submitted by licensees in March 2003, on the decommissioning funding status of 104 commercial nuclear reactors, for the reporting period ending December 31, 2002. NRR completed their review of these reports in September 2004. In March 2005, licensee's submitted decommissioning funding status reports for the period ending December 31, 2004. NRR was conducting their review of the most current reports during the time this audit was conducted. Accordingly, OIG auditors did not evaluate the most current reports.

### **Prior Report Recommendations**

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OIG Audit Report, OIG/99A-16, *Review of NRC's Decommissioning Funding Program*, dated February 1, 2000, contained the following four recommendations:

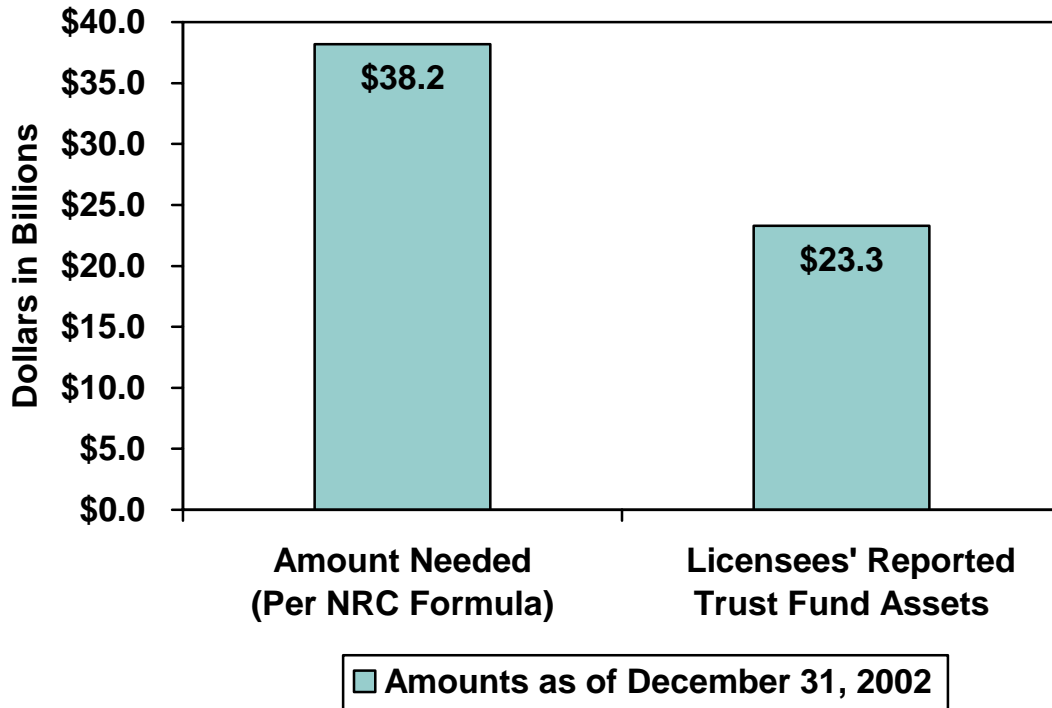
1. Ensure quality control by having the results of the review of the licensees' decommissioning fund status reports examined by an individual other than the primary reviewer, and by documenting all problems found and tracking actions taken to reach resolution.
2. Implement review procedures consistent with the standard review plan (SRP) to ensure all the reporting requirements are met and that consistency in the reported data is achieved. This should include the identification and exclusion of non-radiological costs as specified in the SRP.
3. Conduct a lessons learned exercise to strengthen and enhance the review process.
4. Evaluate the relationship between formula-based and site-specific estimates and consider reassessing the reasonableness of NRC's decommissioning formulas.

### **Total Dollars Invested for the Decommissioning Funds Program**

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OIG's examination of the March 2003 biennial decommissioning funding status report files, that include data for the period ending December 31, 2002, determined the total dollars invested in the program as follows:

## Total Investment (Dollars) of Program



As of December 31, 2002, \$38.2 billion, estimated in 2002 dollars, will be needed for decommissioning, at the time of permanent shutdown, based on the NRC formula. Licensees reported having approximately \$23.3 billion in trust fund assets for decommissioning as of December 31, 2002. Accordingly, the licensees have reportedly accumulated approximately 61 percent of the funds that will be needed at the time of decommissioning based on application of the NRC formula. On average, licensees have approximately 46 percent<sup>5</sup> of the time remaining on their licenses to accumulate the remaining 39 percent of needed decommissioning funds.

<sup>5</sup> 18.5 years, on average, is equivalent to 46 percent of time remaining on licenses. This calculation takes into account eight approved license renewals, as of December 31, 2002, which extend the operating period from 40 years to 60 years.

## **II. PURPOSE**

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The objectives of this audit were to:

- Identify opportunities for program improvement, and
- Evaluate implementation of the recommendations made in OIG audit report, OIG 99A-16, dated February 1, 2000.

### **III. FINDINGS**

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OIG determined that existing program policies need to be strengthened and additional management action is needed on two of four prior OIG audit report recommendations. Consequently, there is (1) \$23.3 billion in decommissioning trust funds at risk, (2) increased vulnerability to decommission funding shortfalls, and (3) potential adverse impacts on the reliability of NRR's assessment of licensee financial assurance and the amount of funds needed for decommissioning.

#### **A. Existing Program Policies Need to be Strengthened**

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NRR cannot verify that there is reasonable assurance that there will be adequate funds for decommissioning nuclear power plants consistent with prudent business practices. Specifically, NRR relies on licensees' representations without obtaining verification of decommissioning trust fund balances and NRC's investment restrictions applicable to decommissioning trust funds are limited in scope and applicability. In the exercise of its nuclear power plant financial management oversight responsibility, NRR, without justification, relies on the actions of the Federal Energy Regulatory Commission (FERC) and State Public Utility Commissions/Public Service Commissions (PUCs/PSCs). As a result, \$23.3 billion in decommissioning trust funds are at risk; there is increased vulnerability to decommission funding shortfalls; and there is a potential adverse impact on NRR's assessment of licensee financial assurance.

##### **Prudent Business Practices**

Prudent business practices call for the verification of licensee reported decommissioning trust fund balances as well as sound investment restrictions for decommissioning trust funds.

##### **Verification of Trust Fund Balances**

While an independent audit of licensee reported trust fund balances would be ideal, it is prudent, at a minimum, to require trustees to report the value of decommissioning trust funds directly to NRC. This is particularly important in light of the significant dollars involved. As of December 31, 2002, licensees reported having decommissioning trust funds valued at approximately \$23.3 billion. This amount is expected to grow as licensees continue to add money to the trust funds and as the funds increase in value as a result of interest, dividends and appreciation.



### Sound Investment Restrictions

It is prudent to promulgate sound investment restrictions applicable to all decommissioning trust funds to prevent situations where the amounts accumulated could diminish or be subject to undue risk. Examples of sound investment restrictions include:

- Trustees should not be permitted to invest in junk bonds, and
- Trustees should be required to follow prudent diversification concepts to ensure that not more than a certain reasonable percentage of funds are invested in any one company or any one industry.

Recent major financial accounting scandals, such as Enron, are proof that the value of a single stock can dramatically decline quickly.

### Financial Assurance is Inadequate

NRR cannot verify that there is reasonable assurance that there will be adequate funds for decommissioning nuclear power plants consistent with prudent business practices. Decommissioning trust fund balances are not verified and NRC's investment restrictions are limited in scope and applicability.

### Decommissioning Trust Fund Balances Not Verified

NRR determines financial assurance without obtaining verification from a trustee that the reported decommissioning trust fund balance is correct. NRR merely relies on licensee representations for the amount accumulated in decommissioning trust funds based on 10 CFR 50.9 which states:

*Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.*

### NRC's Investment Restrictions are Limited in Scope and Applicability

NRC's investment restrictions apply to roughly one-third of its licensed nuclear power plants. These investment restrictions are limited in scope as they do not specifically cover such things as investment in junk bonds or the percentage of funds that can be

prudently invested in any one company or industry. The restrictions merely provide that the trustee is prohibited from investing the funds in: (1) securities or other obligations of the licensee, (2) any other owner or operator of a nuclear power reactor or their affiliates, subsidiaries, successors or assigns, or (3) a mutual fund where at least 50 percent of the fund is invested in the securities of a licensee or parent company whose subsidiary is an owner or operator of a foreign or domestic nuclear power plant.

### **Reliance on Federal Energy Regulatory Commission and State Public Utility Commissions/Public Service Commissions Not Supported**

NRC staff could not provide a written analysis of specific state PUC or FERC requirements upon which the NRC bases its reliance for funding assurance

#### **Federal Energy Regulatory Commission**

While NRR officials stated that they rely on FERC oversight of utility financial management, they have not undertaken any systematic review of FERC regulatory practices to establish the basis for this reliance. FERC officials, when contacted by OIG, stated that their fundamental mandate is to ensure that consumer charges due to decommissioning costs are reflected in the amounts actually deposited into the decommissioning trust funds.

Unlike NRC's regulations, FERC's regulations require utilities to annually submit an original copy of the financial report furnished by the decommissioning trust fund's trustee, as well as any applicable audit opinions by independent public accountants. These reports are posted on the FERC website and are accessible to the general public. FERC's regulations also require that the financial report be mailed to anyone who requests it. NRR does not refer to the FERC website for the financial reports and audit opinions, nor do they request any of these reports by mail. FERC has oversight for approximately half of the nuclear plants that NRR receives a biennial decommissioning status report from.

FERC's regulations also require that the trust fund's investment manager exercise the standard of care that a prudent investor would use in the same circumstances.<sup>6</sup> While this referenced document provides general investment guidance, it does not

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<sup>6</sup> 18 USC 35.32 refers to the Restatement of the Law (Third), Trusts 227, including general comments and reporter's notes, pages 8-101, St. Paul, MN: American Law Institute Publishers, (1992), ISBN 0-314-84246-2, for the description of a "prudent investor."

promulgate any specific investment restrictions limiting investments in a specific company or industry to promote sound diversification principles.

State Public Utility Commissions/Public Service Commissions

While NRR relies on state PUCs/PSCs oversight of utility financial management, NRR officials have not undertaken any systematic review of state PUC/PSC regulatory schemes to establish a basis for such reliance.

The OIG reviewed PUC/PSC legal and regulatory frameworks in six states with varying numbers of nuclear units. The states were selected to be representative of the range of numbers of nuclear units in all states.<sup>7</sup> The results are shown below:

State	Nuclear Units	Specific Statute Addressing Decommissioning <sup>a</sup>	Routine Requirement to Review or Report Decommissioning	Recent Public Utility Commission Action or Report on Decommissioning
Iowa	1	No	No	No
Kansas	1	No	No <sup>b</sup>	Yes <sup>d</sup>
Alabama	5	No	No <sup>c</sup>	Yes <sup>d</sup>
Florida	5	No	Yes – routinely report detailed information including trust fund information	Yes <sup>d</sup>
Illinois	11	No	No	Yes <sup>d</sup>
Pennsylvania	9	No	No	No

<sup>a</sup> State PUC statutory frameworks address recovery of costs of service in general; these statutes do not specifically address decommissioning funding assurance.

<sup>b</sup> Internet search did not identify specific regulations for electricity for Kansas Corporation Commission. There were regulations available for oil and gas exploration and gathering.

<sup>c</sup> “Electricity Section” routinely reviews decommissioning information according to the Alabama PUC website, but *there does not appear to be any regulatory or legal requirement for this review.*

<sup>d</sup> Review at request of utility.

The OIG identified only one state in which there was a specific routine regulatory requirement to review decommissioning information. The Florida Public Service Commission, promulgated regulation 25-6.04365 “Nuclear Decommissioning” for this purpose. The stated intent of this regulation is a demonstration that sufficient funds are on hand at the time of decommissioning to meet all required expenses. This regulation requires filing a site specific decommissioning study and requires explicit approval of accrual

<sup>7</sup> The NRC Information Digest 2005-2006 Edition, NUREG-1350, Volume 17, July 2005, Appendix A contains a listing of the nuclear plants including the location within each state.

methods. The regulation also indicates that the Florida PSC will evaluate each utility's investment performance to determine whether the decommissioning trusts fund earned at least the rate of inflation.

The OIG review did not identify any regulatory requirement for routine reporting or reviewing of decommissioning information in the remaining five states. Four of six states had performed some type of decommissioning fund reviews in response to utility requests. The OIG could not find any records of decommissioning funding review for two of the six states. The Alabama PUC website indicates that PUC staff conducts and documents routine audits of decommissioning costs. There does not appear to be any regulatory or legal requirement for this review.

OIG's review was not based on a statistical sample; therefore, a general conclusion cannot be made regarding other state PUC/PSC decommissioning review frameworks. However, the OIG found that only one of the six states examined has a regulatory requirement for a routine assessment of decommissioning trust fund performance. In addition, the NRR staff has no documented review supporting their reliance on state PUCs/PSCs. These factors bring into question the Agency's reliance on state PUCs/PSCs for financial assurance of decommissioning.

### **Consequences of Inadequate Financial Assurance**

Without verification of the value of the decommissioning trust funds, and absent required sound investment restrictions, \$23.3 billion in decommissioning trust funds are at risk, there is increased vulnerability to decommissioning funding shortfalls, and there is a potential adverse impact on NRR's assessment of licensee financial assurance. At the exit conference the Executive Director for Operations stated that the recommended course of action requires Commission approval.

### **Recommendations**

OIG recommends the Executive Director for Operations (EDO) seek, and the Commission provide, direction whether to:

1. Require verification of decommissioning trust fund balances from trustees.
2. Require specific prudent investment restrictions for decommissioning trust funds.

## **B. Action Needed on Two Prior OIG Recommendations**

NRC did not fully implement its planned corrective actions regarding two prior OIG report recommendations as a result of inadequate monitoring/action by management. Opportunities for improvement continue to exist regarding quality control and reassessment of the NRC formula used to provide decommissioning funding assurance. Accordingly, there is increased vulnerability to decommissioning funding shortfalls and potential adverse impacts on the reliability of NRC's assessment of licensee financial assurance and the amount of funds needed for decommissioning.

### **Quality Control**

While NRC did not adequately implement its June 2001 corrective action plan regarding quality control, it recently issued an office instruction which includes updated quality control policy/procedures. The new office instruction and documented practices do not fully comply with the United States Government Accountability Office (GAO), *Standards for Internal Control in the Federal Government*, GAO/AIMD-00-21.3.1, dated November 1999, regarding timeliness and documentation. Quality control deficiencies can impair the usefulness of the financial assurance report to the Commissioners.

### **NRC Corrective Action Plan**

In the June 2001 memorandum, the NRC described a corrective action plan for establishing quality control for the review of licensee submitted biennial decommissioning funding status reports. The corrective action plan included such things as use of a data excerpt sheet to document primary and quality control reviews with signature lines for each reviewer, as well as various actions by the first-line supervisor. According to the plan, the first-line supervisor plays a vital role in ensuring that the primary and quality control reviews are performed correctly, are appropriately documented, and that the report to the Commissioners is reliable.

### **Inadequate Implementation of Corrective Action Plan**

Insufficient management monitoring resulted in inadequate implementation of the corrective action plan. Portions of the corrective action plan were not implemented and quality assurance was not performed timely.

### Portions of Corrective Action Plan Not Implemented

OIG examined the 2003 biennial decommissioning funding status report files and determined that while NRC did establish a quality control process, it was not fully implemented according to the corrective action plan described in the June 2001 memorandum. Specifically, NRR did not use the data excerpt sheet described in, and attached as an appendix to, the June 2001 memorandum. The data sheets that NRR did use did not contain signature lines and were hard to read and understand. OIG auditors could not clearly distinguish whether the calculations were that of the primary reviewer, the quality control reviewer, or someone else. It was also not clear which numbers were used to determine financial assurance, if there were problems identified with the licensees' reports, and/or how those problems were resolved. In addition, there was no evidence of first-line supervisory involvement during the entire process and there was no documented summary of the results of the quality control review. The GAO *Standards for Internal Control in the Federal Government* call for monitoring by management and clear documentation of internal control and significant events.

### Quality Assurance Not Timely

NRR's quality control review of the 2003 biennial decommissioning funding status reports was conducted approximately 7 months after the report on the status of licensee decommissioning funds was issued to the Commissioners. To be useful, quality control must be performed prior to, rather than after, the report to the Commissioners is issued. Furthermore, NRR did not issue a report summarizing the results of its quality control review. The GAO *Standards for Internal Control in the Federal Government* emphasize the importance of timely communications.

### LIC-205

NRR management issued an office procedure, LIC-205, "Procedures for NRC's Independent Analysis of Decommissioning Funding Assurance for Operating Nuclear Power Reactors," dated June 29, 2005. LIC-205 describes the procedures to perform a review of licensees' biennial decommissioning funding status reports, as well as the procedures to conduct and report on the quality control review. While this is a positive step, LIC-205 does not (1) prescribe a timeframe within which quality control procedures are to be performed and (2) require separate documentation of the quality control review. Quality control deficiencies can impair the usefulness of the financial assurance report to the Commissioners.

## **Reassessment of the NRC Formula**

OIG's report of February 2000 addressed the agency developed formulas for estimating the minimum amounts required to demonstrate reasonable assurance of funds for decommissioning. When compared to site-specific estimates developed at that time, OIG found that the site-specific estimates exceeded the formula based estimates. NRC deferred implementation of corrective action to reassess the reasonableness of its formula used to provide decommissioning funding assurance. The formula that was established almost 20 years ago is comprised of two tiers. The first tier computes the minimum decommissioning cost in 1986 dollars. The second tier of the formula adjusts the amount computed in the first tier, from 1986 dollars to current year dollars, based on three different escalation factors. Despite the age of the formula, the availability of additional relevant data, and continuing evidence showing that site-specific estimates routinely exceed formula amounts, the formula has not been reassessed in the last 10 years. Consequently, there is increased vulnerability to decommissioning funding shortfalls and potential adverse impacts on the reliability of NRC's assessment of licensee financial assurance and the amount of funds needed for decommissioning.

### **Relevant Criteria**

The calculation in 10 CFR 50.75(c), addressing decommissioning planning, is intended to provide reasonable assurance of a minimum decommissioning cost for operating power reactors at the time of permanent cessation of operations.

The GAO *Standards for Internal Control in the Federal Government* require management to identify and analyze relevant risks and determine their possible effect. These standards also require monitoring to ensure that corrective actions are promptly taken.

### **Prior Validation of NRC's Formula**

In 1995 the agency performed rigorous evaluations<sup>8</sup> that provided reasonable assurance that the regulation's formulation was conservative relative to hypothetical cost evaluation models. These evaluations contain detailed breakdowns of cost factors associated with the decommissioning of two actual nuclear facilities. For

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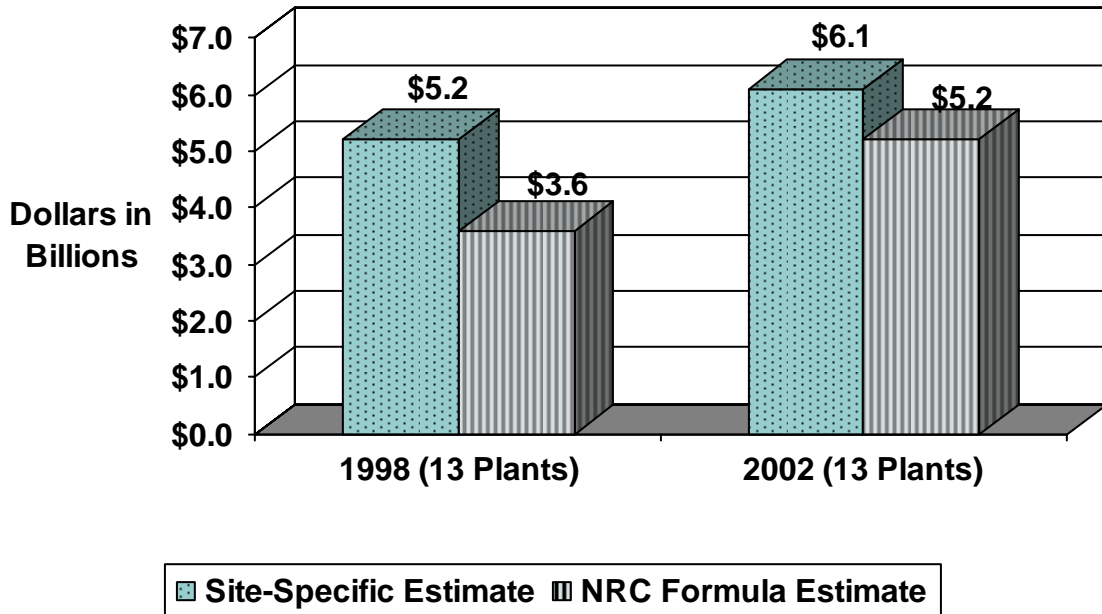
<sup>8</sup> Revised Analysis of Decommissioning for the Reference Boiling Water Reactor Power Station Vol. 1 Main Report and Vol.2 Appendices, NUREG/CR 6174 (1995) and Revised Analysis of Decommissioning of the Reference Pressurized Water Reactor Power Station Vol. 1 Main Report and Vol. 2 Appendices, NUREG/CR 5884 (1995).

example, waste transportation costs contained in NUREG/CR-6174 included actual route mileage values, calculations of cargo weights, specific cask designs and actual tariff values from a transport carrier.

Although these evaluations were rigorous, they are approximately ten years old. In the last ten years actual decommissioning costs data has accumulated and should be available for assessing these hypothetical models. Detailed cost factors embedded in the evaluations could also have changed since the 1995 evaluations. The NRC staff has no documented evaluation substantiating the current validity of the conclusions reached in 1995 in NUREG/CR 6174 and NUREG/CR 5884.

Site-Specific Estimates Consistently Higher than NRC Formula Estimates

**Comparison of Site-Specific vs. NRC Formula Estimates**



The prior OIG audit (February 2000) contained site-specific estimates submitted for 13 plants<sup>9</sup>, that were approximately 44 percent higher than the minimum decommissioning cost estimates calculated using the NRC formula. OIG's current analysis of the December 31, 2002 data, concluded that the site-specific estimates submitted for 13 plants<sup>9</sup> were approximately 16 percent higher than the minimum decommissioning cost

<sup>9</sup> The site-specific estimates submitted by licensees included radiological decommissioning costs only.



estimates calculated using the NRC formula. The results of these analyses is cause for continuing concern that the NRC formula requires updating and, if not revisited, could result in significant funding shortfalls at the time of decommissioning. It is prudent to reevaluate and adjust the NRC formula now to prevent possible significant decommission funding shortfalls in the future.

Consequences of Delayed Implementation of Prior Report Recommendation

As a result of management's delay in addressing OIG's earlier recommendation, significant vulnerabilities remain for decommission funding shortfalls, and potential adverse impacts on the reliability of NRR's assessment of licensee financial assurance and the amount of funds needed for decommissioning.

**Recommendations**

OIG recommends that the EDO:

3. Prescribe and implement a timeframe within which quality assurance will be performed.
4. Clearly document quality assurance work performed.
5. Update NRC's decommissioning formula considering the relationship between formula based and site-specific estimates.

## **IV. CONSOLIDATED LIST OF RECOMMENDATIONS**

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OIG recommends that the EDO seek, and the Commission provide, direction whether to:

1. Require verification of decommissioning trust fund balances from trustees.
2. Require specific prudent investment restrictions for decommissioning trust funds.

OIG recommends that the EDO:

3. Prescribe and implement a timeframe within which quality assurance will be performed.
4. Clearly document quality assurance work performed.
5. Update NRC's decommissioning formula considering the relationship between formula based and site-specific estimates.

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## **SCOPE AND METHODOLOGY**

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To accomplish the audit objectives, the OIG reviewed and analyzed pertinent laws, regulations, authoritative guidance and prior relevant OIG and GAO reports. In addition, OIG analyzed decommissioning laws and regulations for six states. OIG conducted interviews with selected NRC officials to:

1. Gain an understanding of the agency's decommissioning funding process,
2. Determine current issues, problems, known deficiencies, and
3. Assess management controls.

OIG interviewed officials from FERC and GAO to obtain clarification of their roles, responsibilities, and perspectives regarding decommissioning funding.

OIG reviewed and analyzed the decommissioning funding status reports submitted by licensees in March 2003, for the reporting period ending December 31, 2002, in order to:

1. Determine the magnitude of the program,
2. Evaluate NRC's implementation of agreed-to actions in response to recommendations from a prior OIG audit report,
3. Verify, on a test basis, NRC's computations of the minimum decommissioning cost estimate using the NRC formula, and
4. Determine the difference between formula based and site-specific estimates.

OIG conducted this audit in accordance with Generally Accepted Government Auditing Standards from January 2005 through October 2005.

The major contributors to this report were Steven Zane, Team Leader; Michael Cash, Technical Advisor; and Terri Cooper, Senior Auditor.

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## **THE NUCLEAR REGULATORY COMMISSION'S MINIMUM DECOMMISSIONING FUNDING ESTIMATE FORMULA**

The complete two-tiered NRC minimum decommissioning funding estimate formula provided in 10 CFR 50.75(c) is shown below:

(c) Table of minimum amounts (January 1986 dollars) required to demonstrate reasonable assurance of funds for decommissioning by reactor type and power level, P (in Mwt); adjustment factor.<sup>1</sup>

	<i>Millions</i>
(1)(i) For a PWR: greater than or equal to 3400 Mwt	\$105
between 1200 Mwt and 3400 Mwt (For a PWR of less than 1200 Mwt, use P=1200 Mwt)	\$(75+0.0088P)
(ii) For a BWR: greater than or equal to 3400 Mwt	\$135
between 1200 Mwt and 3400 Mwt (For a BWR of less than 1200 Mwt, use P=1200 Mwt)	\$(104+0.009P)

(2) An adjustment factor at least equal to  $0.65 L + 0.13 E + 0.22 B$  is to be used where L and E are escalation factors for labor and energy, respectively, and are to be taken from regional data of U.S. Department of Labor Bureau of Labor Statistics and B is an escalation factor for waste burial and is to be taken from NRC report NUREG-1307, "Report on Waste Burial Charges."

<sup>1</sup> Amounts are based on activities related to the definition of "Decommission" in § 50.2 of this part and do not include the cost of removal and disposal of spent fuel or of nonradioactive structures and materials beyond that necessary to terminate the license.

The first tier of the formula computes the minimum decommissioning amount, in 1986 dollars, that will be needed at the time of permanent cessation of operations. The first tier is based on the reactor type and power level of the reactors.

The second tier of the formula adjusts the amount computed in the first tier, from 1986 dollars to current year dollars, based on escalation factors of labor, energy, and burial. The factors for labor and energy are found in regional data of U.S. Department of Labor Bureau of Labor Statistics, and the factor for burial is found in NRC's NUREG-1307, "Report on Waste Burial Charges," which is updated approximately every two years.

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## **ITEMS REQUIRED TO BE INCLUDED IN BIENNIAL DECOMMISSIONING FUNDING STATUS REPORTS**

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The following seven items are required by 10 CFR 50.75(f) to be included in the biennial decommissioning funding status reports submitted to NRC by licensees:

1. The amount of decommissioning funds estimated to be required pursuant to 10 CFR 50.75(b) and (c);
2. The amount accumulated to the end of the calendar year preceding the date of the report;
3. A schedule of the annual amounts remaining to be collected;
4. The assumptions used regarding rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections;
5. Any contracts upon which the licensee is relying pursuant to paragraph (e)(1)(v) of this section;
6. Any modifications occurring to a licensee's current method of providing financial assurance since the last submitted report; and
7. Any material changes to trust agreements.