POLICY ISSUE
INFORMATION

October 6, 2009 SECY-09-0146

FOR: The Commissioners

FROM: Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

SUBJECT: 2009 SUMMARY OF DECOMMISSIONING FUNDING STATUS REPORTS FOR NUCLEAR POWER REACTORS

PURPOSE:

This paper summarizes the U.S. Nuclear Regulatory Commission (NRC) staff's findings based on its review of biennial decommissioning funding status reports from nuclear power reactor licensees. The reports were due to the NRC by March 31, 2009, and reflect decommissioning funding status as of December 31, 2008. Any future commitments or resource implications as a result of the 2009 Biennial Decommissioning Funding Review are not being addressed in this paper.

SUMMARY:

Based on the 2009 Biennial Decommissioning Funding Review, seventy-seven plants provided adequate decommissioning funding assurance (DFA). The staff determined that twenty-seven plants were not providing adequate DFA, as of December 31, 2008. The NRC received all corrective plans from licensees identified as having DFA shortfalls as of September 4, 2009, and is continuing its discussions with these licensees to resolve the shortfalls.

BACKGROUND:

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.75(f)(1), requires all nuclear power reactor licensees to submit decommissioning funding status reports every two years. As a framework for analyzing these reports, the staff uses guidance from three primary sources:

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NUREG-1577, Rev. 1, "Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance," issued February 1999; Regulatory Guide (RG) 1.159, Rev. 1, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," issued October 2003; and Office Instruction LIC-205, Rev. 2, "Procedures for NRC's Independent Analysis of Decommissioning Funding Assurance for Operating Nuclear Power Reactors," issued April 2006.

The primary components of the staff's review include: (1) an analysis of the latest decommissioning cost estimate for each operating unit, which is adjusted annually; (2) a calculation of projected earnings allowed by rule on decommissioning fund balances and future deposits; and (3) an assessment of the reasonableness of schedules to collect additional funds in the future by licensees who are not required to prepay decommissioning funds but instead are authorized to accumulate funds over time.

The funding status reports summarize the status of licensees' decommissioning funding assurance arrangements (DFA) as of the end of calendar year 2008. The staff has conducted these reviews on a biennial basis since 1998. The most recent summary (in SECY-07-0200, "2007 Summary of Decommissioning Funding Status Reports for Nuclear Power Reactors," dated November 14, 2007, (Agencywide Documents Access and Management System Accession No. ML072600040)) covered funding through the end of 2006.

DISCUSSION:

The staff evaluated the information in the current biennial decommissioning funding status reports for all 104 operating nuclear power reactors.[1]

Method of Determining Decommissioning Funding Assurance (DFA)

To analyze the biennial decommissioning funding reports, the staff divided the licensees into two major categories: (1) electric utilities (licensees who accumulate funds over time using external sinking funds), and (2) non-electric utilities (licensees who must prepay funds), as described below.

Licensees who use external sinking funds are either: (a) electric utilities that are entitled to recover decommissioning costs through rates established by a State regulatory authority and, if there are wholesale power sales, by the Federal Energy Regulatory Commission (FERC); (b) self-regulated electric utilities that establish rates on their own to recover decommissioning costs (e.g., Tennessee Valley Authority (TVA); or (c) non-electric utilities that are indirectly regulated because they receive non-bypassable charges authorized by a regulatory authority.

Electric Utilities

Licensees who use external sinking funds are subject to an analysis based on the consideration of a number of factors, including: (1) the number of years remaining on the license for operations, including any renewal period approved by the NRC; (2) the amount of scheduled contributions to the decommissioning fund that must be collected in each remaining year and

[1] Information for the 18 units that have been permanently shut down is not included in this report.

whether the scheduled amounts are generally level or projected to increase significantly in later years; (3) the percentage of current licensee revenues accounted for by annual decommissioning collection amounts; (4) whether the plant has any known operational concerns that will increase the likelihood of premature shutdown; (5) whether the licensee currently has sufficient funds, based on a site-specific decommissioning cost estimate, to place the plant into a long-term storage condition (e.g., Safe Storage(SAFSTOR)); and (6) any relevant State legislation and public utility commission actions and decisions that may impact decommissioning funding.

The staff's review is performed on a case-by-case basis for each reactor, and primarily focuses on whether the schedules of annual amounts remaining to be collected by the licensees are adequate and reasonable, and whether the assumptions on rates of earnings are reasonable and adequately substantiated. The review is consistent with NRC jurisdiction[2] and the NRC's historical position that States and the FERC are the primary regulatory authorities to ensure an appropriate rate of collection. At the same time, it allows the NRC to make a separate determination regarding whether there is reasonable assurance that a licensee authorized to use an external sinking fund will be able to eventually fund the decommissioning of its plant.

The NRC's decommissioning funding regulation, 10 CFR 50.75, "Reporting and Recordkeeping for Decommissioning Planning," does not require licensees using external sinking funds to make deposits in amounts and at rates that follow any predetermined schedule.[3] Section 2.2.8 of Regulatory Guide 1.159 does contain guidance as to the amount "[a]nnual deposits in an external sinking fund…should attempt to approximate." That is "… the total amount remaining to be accumulated, divided by the remaining years of the license…" However, the staff has never sought to require that a licensee adhere strictly to a generic collection schedule. Instead, the Commission has deferred consistently to state public utility commissions and FERC on the timing of deposits, which is partially based on "the long history of effective rate regulatory oversight and recovery of safety related expenses through rates." ("Final Policy Statement on the Restructuring and Economic Deregulation of the Electric Utility Industry" (Final Policy Statement), Volume 62 of the *Federal Register*, page 44,074 (62 FR 44071); August 19, 1997).[4]

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[2] See, e.g. section 271 of the Atomic Energy Act of 1954, as amended (42 U.S.C. section 2018) which provides in relevant part that "[n]othing in the [Atomic Energy Act] shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to the generation, sale, or transmission of electric power produced through the use of nuclear facilities licensed by the Commission…"; Pacific Gas & Electric Co. v. State Energy Resources Conservation and Development Commission, 461 U.S. 190, at 208 (1983) (section 271 removed "any doubt that rate making and plant-need questions were to remain in state hands").

[3] The NRC specifically stated that it's decommissioning funding rule, "and the NRC's implementation of it, does not deal…with rate of collection…"General Requirements for Decommissioning Nuclear Facilities, Final Rule, 53 FR 24018 (June 27, 1988), cited in Final Policy Statement on the Restructuring and Economic Deregulation of the Electric Utility Industry (Final Policy Statement), 62 FR 44071 (Aug. 19, 1997).

[4] In the response to comments on the draft statement prior to the issuance of the Final Policy Statement, the Commission stated that "[t]o date, the NRC has found no significant instances in which State or Federal rate regulation has led to disallowance of funds for safety-related operational and decommissioning expenses." *Id*. at 44,076. The staff is aware of one case where $12 million in costs were disallowed for rate recovery in a preliminary decision. However, in a later rate case, the parties reached a settlement regarding the disallowed costs.

Non-Electric Utilities

All remaining licensees – those not subject to state regulation or receiving non-bypassable charges are not authorized to use an external sinking fund as their exclusive method of decommissioning funding assurance.

Before the deregulation of electric utilities, direct NRC oversight of the terms and conditions of decommissioning funding trusts was deemed unnecessary because of the rigorous ratemaking process undertaken by state public service commissions, including reviewing and re-calculating annual contributions to nuclear decommissioning trust (NDT) funds. The Commission recognized the need for the NRC to take a more active oversight role regarding decommissioning funding issues with the removal of the protective layer of State rate regulation following industry restructuring in the late 1990s. The 1998 final rule added several requirements under 10 CFR 50.75, including the biennial reporting by licensees and up front financial assurance by non-electric utilities. Since the NRC rulemaking effort regarding DFA in 1998, the number of non-electric utilities has grown to 36 percent of the total power reactors in the United States.

The staff analyzed these licensees' existing decommissioning fund balances and factored in earnings credits allowed by NRC regulations. The staff also considered any supplemental decommissioning funding assurance mechanisms such as parent company guarantees, or future collections. To determine whether currently estimated minimum decommissioning costs are covered by these amounts, the staff compared the total funding to the minimum decommissioning cost estimate for the particular unit using NRC formulas in 10 CFR 50.75, "Reporting and recordkeeping for decommissioning planning."

Results of NRC Staff Evaluations

1) Summary

Table 1: 2009 Biennial Decommissioning Funding Status as of December 31, 2008

	Type of Ownership			
Description	**Electric Utility**	**Non-Electric Utility**	**Hybrid[5]**	**Total**
Number of Power Reactors	67	28	9	104
Number Providing Adequate Decommissioning Funding Assurance (DFA)	58	12	7	77
Number with DFA shortfall	9	16	2	27
Average Decline in Trust Fund Balance per Unit (since December 31, 2006)	-11%	-18%	-15%	-13%

[5] Hybrid ownership exists with multiple owners where at least one owner is an electric utility and at least one owner is a non-electric utility.

- Seventy-seven plants provided adequate decommissioning funding assurance as of December 31, 2008.[6]

- Of the plants that have adequate decommissioning funding assurance, 14 plants have fully funded decommissioning accounts that meet or exceed the NRC's minimum formula amounts. In theory, if these units were permanently shut down today, they would have sufficient funds available to complete radiological decommissioning.

- Funding levels for nuclear reactor decommissioning trust amounts decreased markedly between the 2007 and 2009 Biennial Decommissioning Reviews. On average, external sinking fund licensee trust fund amounts dropped by 11 percent on a per-unit basis. Non-electric utility trust funds decreased by an average of 18 percent per unit, as depicted in Table 1.

- As of December 31, 2008, nuclear power reactor licensees collectively had approximately $31.3 billion in external decommissioning trust accounts for radiological decommissioning.[7] This figure represents about 67 percent of the aggregate minimum decommissioning funds that will be needed at the time of permanent shutdown, based on 2008 calculations and the generic formulas in 10 CFR 50.75(c). Total funding levels for the previous Biennial Decommissioning Report, as of December 31, 2006, was $35.8 billion, which was approximately 84 percent of the total minimum funding amount.

2) Licensee Shortfalls

In the aggregate, the total shortfall in decommissioning funding for all licensees, as of December 31, 2008, is over $2.4 billion. These shortfalls ranged from $500,000 to $199 million per unit, and are consolidated among six owners. Approximately half of the total unfunded DFA liability ($1.1 billion) reflects shortfalls for eight plants belonging to a single owner, Exelon Corporation. The total DFA shortfall per parent company and the average unit shortfall per parent company are shown in Figures 1 and 2.

[6] The licensee for one electric utility unit, Limerick Generating Station, Unit 1, provided a plan to cover a projected DFA shortfall as part of their 2009 Biennial Decommissioning Report. The staff accepted the plan and concluded that Limerick Unit 1 was providing adequate decommissioning funding assurance. As of September 30, 2009, seventy-eight plants are providing adequate DFA and twenty-six plants have DFA shortfalls.

[7] This amount does not include projected credits or the two percent real rate of return.

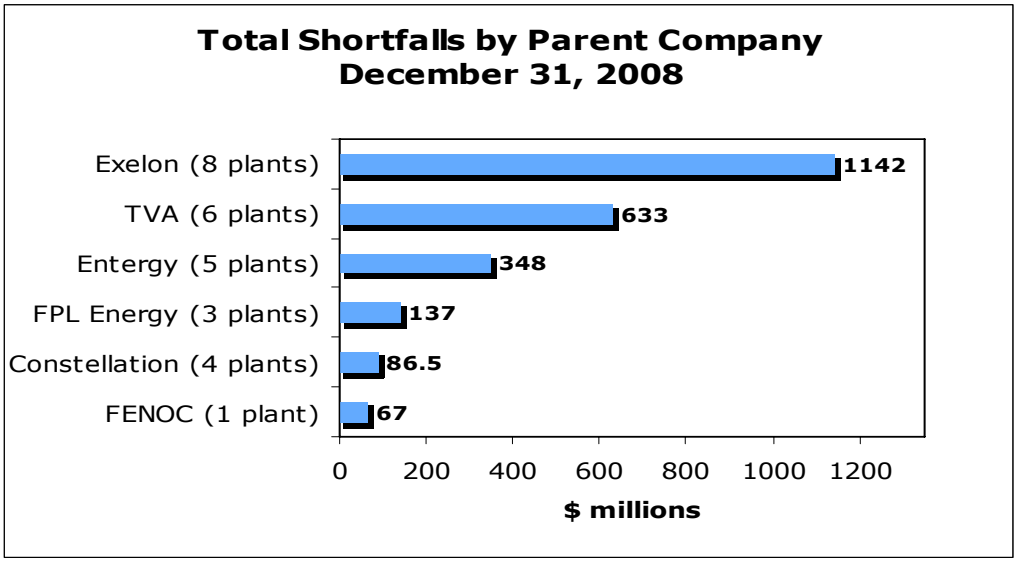

Figure 1: Total Shortfalls by parent company

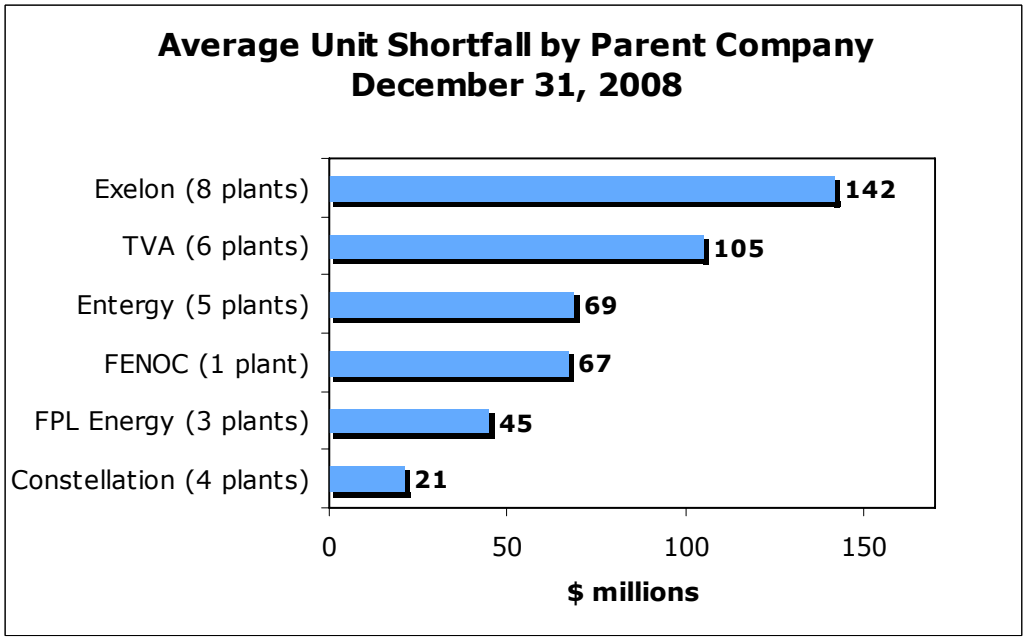

Figure 2: Average parent company shortfall

a) Electric Utility Shortfalls

Of the 26 units with DFA shortfalls, eight units, or approximately 10 percent of all licensees authorized to exclusively use external sinking funds (electric utilities), are not on track to accumulate amounts at least equal to their minimum decommissioning cost estimates by permanent shutdown as of December 31, 2008.

The total shortfall in DFA for electric utilities is $955 million. TVA owns six of these eight units. TVA is a self-regulated utility, which sets its own rates for decommissioning funding.

b) Non-Electric Utility[8] Shortfalls

The results of the 2009 Biennial Decommissioning Funding Review indicate that 18 non-electric utility plants are not currently providing adequate decommissioning funding assurance. This represents 50 percent of all non-electric utilities (18 of 36 total non-electric utility plants). The total shortfall in DFA for non-electric utilities and hybrid plants is over $1.4 billion.

3) Potential Factors Impacting Decommissioning Funding Assurance

Although poor financial market returns for the period of 2006 to 2008 have had a significant impact on decommissioning trust fund balances, this factor alone may not entirely account for current shortfalls in decommissioning funding assurance.

One major financial market investor, Duff and Phelps Investment Management Company, a principal firm in providing trustee and investment services for NDTs, published a summary report in July 2009 regarding the current status of NDT balances. First, they note that recent declines in decommissioning trust funds have been less severe than the overall market decline for the same period, which they attribute to NDT asset allocation. Typical asset allocation for decommissioning trust funds is a weighted index of 60 percent S&P 500 and 40 percent Barclays Capital Aggregate.[9] Between December 2007 and December 2008, this "sample" index declined 22.1 percent, and likewise, total NDTs declined by approximately 20.3 percent.[10] The overall decline of the S&P 500 for the same period was 38.6 percent.[11]

Duff and Phelps also cited the long term decline in annual licensee contributions to NDTs as a contributing factor to decreasing decommissioning trust fund balances. The report stated that aggregate annual contributions to trust funds have dropped from an average of $1.5 billion for the years prior to 2003 to around $562 million in 2008.[12] Duff and Phelps attributed this drop in annual contributions to two factors: (1) the acquisition of plants by non-electric utilities, resulting in pre-funding ("top-off payments") of decommissioning trust funds; and (2) a number of approved license extensions, resulting in a longer overall contribution period, which reduces the amount of each annual contribution.

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[8] These figures include two so-called "hybrid" plants, with both utility and non-electric utility part owners.

[9] "NDT Rules and Regulations Summary as of July 2009," Duff and Phelps Investment Management Co., August 26, 2009, http://www.dpimc.com/productlines/8.

[10] "NDT Rules and Regulations Summary as of July 2009."

[11] "S&P 500 Index Historical Performance", Yahoo Finance, September 9, 2009. http://finance.yahoo.com/q/hp?s=%5EGSPC

[12] Includes trust funds for non-operating facilities for which decommissioning has not yet commenced.

Licensees also reduce their annual contributions based on market performance. Rising stock values increase the value of trust fund assets, and have allowed licensees to make smaller contributions today to meet projected requirements 10 or more years into the future.

More robust funding in the years immediately following industry restructuring may primarily explain how NDTs weathered a similarly severe drop (36 percent) in the S&P index between 2000 and 2002.[13] As contributions dropped between 2003 and 2007, and the target minimum decommissioning funding formula amount increased, NDTs were thus more vulnerable to the 2007-2008 market decline.

4) Addressing Decommissioning Funding Shortfalls

Following the initial analysis of the 2009 Biennial reports, the staff conducted telephone conferences with the licensees of the 26 units identified as having DFA shortfalls. The purpose of the calls was to clarify the amount of the DFA shortfalls calculated by the NRC staff for the subject units, to clarify the methodology the NRC staff used to determine DFA levels, and to establish a schedule these licensees to submit plans to address potential shortfalls.

The NRC received corrective plans from all of these licensees as of September 4, 2009 and has completed a preliminary review of them. Several of the submitted plans require further clarification regarding valuation of the projected shortfalls, acceptance of SAFSTOR estimates, and other methodological issues. The staff is continuing its discussions with the licensees to resolve the shortfalls.

PUBLIC MEETING:

Based on significant public interest regarding the shortfalls in decommissioning funding for operating reactors, the NRC conducted a Category 3 public meeting on August 20, 2009. The purpose of the meeting was twofold: first, to clarify the NRC's Biennial Decommissioning Funding Report process, and second, to explain the proposed changes to the draft regulatory guidance (DG-1229, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," issued June 2009). NRC staff provided presentations on these two topics and stakeholder comments and questions were solicited. As a result, no changes to the current regulatory approach were identified.

COMMENTS:

Nuclear Energy Institute (NEI) submitted a letter (Agencywide Documents Access and Management System Accession No. ML092590128), dated September 10, 2009, regarding DG-1229, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors". The letter expressed NEI's concern with the staff's interpretation of 10 CFR 50.75(b)(1) and (b)(2) in relation to the allowed time-frame to resolve DFA shortfalls.

[13] "S&P 500 Index Historical Performance."

CONCLUSION:

The staff identified no concerns with the decommissioning funding assurance levels for 78 operating nuclear power reactors. Staff will make use of available regulatory tools to resolve decommissioning funding shortfalls with the licensees for the remaining 26 power reactors.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

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