

## **POLICY ISSUE**

(NOTATION VOTE)

September 28, 2011

SECY-11-0133

FOR: The Commissioners

FROM: R. W. Borchardt  
Executive Director for Operations

SUBJECT: OPTIONS TO EVALUATE REQUESTS TO USE DISCOUNTED PARENT COMPANY GUARANTEES TO ASSURE FUNDING OF DECOMMISSIONING COSTS FOR POWER REACTORS

### PURPOSE:

The purpose of this paper is to request Commission direction on options regarding licensee requests to use a discounted parent company guarantee (PCG) for funding of decommissioning costs for power reactors.

### SUMMARY:

On October 25, 2010, the Commission issued Staff Requirements Memorandum (SRM) SECY-10-0084, "Explanation of Changes to Revision 2 to Regulatory Guide (RG) 1.159, 'Assuring the Availability of Funds for Decommissioning Nuclear Reactors'" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102980565). The Commission directed the staff of the U.S. Nuclear Regulatory Commission (NRC) to revise RG 1.159, Revision 2, in accordance with the SRM and to engage stakeholders and relevant experts in a workshop to develop an options paper on the net present value (NPV) approach for discounting a PCG. This paper provides the staff response.

RG 1.159 was revised as directed by the Commission. It is currently in process for final issuance. A workshop was held on March 2, 2011, to obtain comments from experts and relevant stakeholders. A follow-up meeting was held on June 8, 2011, to better understand stakeholder views and to determine the extent of agreement among stakeholders and the NRC staff.

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The two meetings produced 13 presentations, 7 written sets of comments, and over 500 pages of transcripts discussing many aspects of the NPV approach and its potential effects on the stakeholder community. The Nuclear Energy Institute (NEI) submitted comments and presentations on 6 occasions since August 2009. NEI requested NRC to allow discounted PCGs. The State of New York Office of the Attorney General submitted comments and presentations on 5 occasions since November 2010. Among other issues, New York requested NRC not to allow discounted PCGs. This paper presents the options for consideration. Enclosure 1 provides the resource estimates. The other enclosures to this paper present the details of the staff's evaluation, including a discussion of the information reviewed to prepare the options, responses to comments, and questions and answers on financial assurance.

### BACKGROUND:

NPV is a tool for appraising the value of long-term projects by discounting estimated future cash inflows and outflows backward in time, which reduces them to today's dollars. The cash flows can be compared to determine if the project will be profitable, assuming the estimates are accurate. NEI proposed to discount the cost of decommissioning, using NPV to determine the size of the discount, and to guarantee the discounted amount using the PCG, in whole or part. A PCG valued in this manner is termed a "discounted PCG." NEI stated that a discounted PCG should be acceptable because earnings credits are permitted for actual funds held in a nuclear decommissioning trust (NDT). With respect to NEI's proposal, the NPV approach may refer to either adding an earnings credit to the PCG or discounting the PCG.

The March 2011 workshop attracted a distinguished panel of speakers from the financial community, State and Federal agencies, nuclear professionals, and the industry. Presentations included the use of NPV, or discounting, approach; the rise in decommissioning costs; historical NDT investment performance; the probability of funding success; risks to local communities, States, and Tribal governments; and the burden on industry when using PCGs. Participants stated that they found the range of topics informative and relevant to their issues. Stakeholders varied in their views about the impact of allowing discounted PCGs

In addition to the information developed at the workshops, the staff reviewed the regulatory history of Title 10 of the *Code of Federal Regulations* (10 CFR) § 50.75 since 1988; NRC license transfer orders; Commission memoranda and orders; and licensee decommissioning fund status reports. The staff also reviewed information from licensee parent company financial reports; filings with the U.S. Securities and Exchange Commission; the use of Monte Carlo analysis by the U.S. Federal Reserve for bank stress testing following the 2008 market crisis; generally accepted accounting procedures specified by the Financial Accounting Standards Board; academic articles on investment expectations, Monte Carlo analysis of NDTs, and the financial risks of energy trading; reports by the U.S. Government Accountability Office on the application of Monte Carlo probability methods for assessing the likelihood of success of trust fund investments; regulations issued by other Federal agencies specifying financial responsibility requirements; Federal case law on enforcement of U.S. Environmental Protection Agency financial responsibility regulations; and filings with State Public Service Commissions regarding decommissioning funding.

### DISCUSSION:

In its last comment on NPV discounting, NEI agreed that all combinations of methods of decommissioning financial assurance (DFA), save one, are subject to the equivalency test specified in 10 CFR 50.75(e)(1)(vi).<sup>1</sup> The exception, according to NEI, is a combination of an external sinking fund, a discounted PCG, and the licensee's commitment to adjust the PCG amount annually to account for changes in decommissioning costs (hereinafter called the "sinking fund discount combination").<sup>2</sup> NEI stated that the sinking fund discount combination should equal the total amount of funds estimated to be necessary for decommissioning, with the understanding that the total amount would be reduced by a discount calculated using an NPV approach.

Three options are described below: (1) do not allow the sinking fund discount combination, (2) allow the sinking fund discount combination without approval, conditions, or evaluation of equivalency, or (3) allow the sinking fund discount combination with conditions on a case-by-case basis. Enclosure 1 lists the pros and cons for each option and the associated resource estimates. The staff recommends Option 3.

#### Option 1: Do Not Allow the Sinking Fund Discount Combination

A review of the regulatory history confirmed that discounts to the amount of DFA required from the licensee were never intended and are not permitted by the regulations. The regulations permit an earnings credit for funds held in the NDT. If this option is selected, licensees would be informed via generic communication.

However, pursuant to § 50.75(e)(1)(vi), the NRC has discretion to consider methods that are not allowed by the regulations on a case-by-case basis. In the 2001 license transfer of Fitzpatrick and Indian Point Unit 3 from the Power Authority of New York (PASNY) to Entergy Nuclear Operations (PASNY transfer) the Commission explained that other methods may be considered:

[It is] the Commission's intention to at least consider, on a case-by-case basis, funding assurance mechanisms not expressly permitted under subsections [§ 50.75(e)(1)](i) through (v).<sup>3</sup>

Nevertheless, disallowing the sinking fund discount combination may be appropriate for several reasons. First, disallowing it would avoid potential increased risks to stakeholders. Significantly, while combinations of methods are allowed for all NRC licensees, only reactor licensees are subject to case-by-case evaluation and an equivalency test.<sup>4</sup> Some stakeholders stated that the discounted PCG shifts risk to local communities, States, and Tribal governments.<sup>5</sup> The Statement of Considerations ("SOC") for the 1998 Decommissioning Rule identified potential risks when the PCG is used by power reactor licensees.<sup>6</sup>

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<sup>1</sup> NEI, Industry Comments on June 8 Workshop, p.10, July 13, 2011 (ML11196A203)

<sup>2</sup> Id. at 9

<sup>3</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating Unit No. 3), CLI-00-14, 53 NRC 488, 550-551 (2001) [Hereinafter 53 NRC 488]

<sup>4</sup> Compare § 30.35, § 40.36, § 50.75, § 70.25, § 72.30. See 63 FR 50465, 50469 and 50473 for a discussion of the need for case-by-case evaluation of non-standard financial assurance methods for reactor licensees.

<sup>5</sup> State of New York Office of the Attorney General, Comments Submitted by the State of New York Concerning the March 2, 2011, Decommissioning Funding Workshop and Related Issues, April 7, 2011 (ML111030522)

<sup>6</sup> See discussion on 1998 Decommissioning Rule in the enclosed Additional Information

- questionable applicability of the PCG's financial test to reactors<sup>7</sup>
- incentive to shift costs and avoid greater responsibility<sup>8</sup>
- incentive to delay or cease contributions to the NDT<sup>9</sup>

A second concern is that the minimum amount prescribed by § 50.75(c) is designed to provide only the “bulk” of the decommissioning cost, not the full cost.<sup>10</sup> A discounted PCG used by a merchant plant licensee, without access to rate-payer funds, increases the risk that unfunded decommissioning obligations may occur, due to delay or cessation of contributions to the NDT.

As the NRC stated in the SOC for the 1998 Decommissioning Rule:

Making riskier financial assurance mechanisms available to riskier licensees compounds risk to the public that adequate funds will not be available when needed. Thus, prudent public policy may limit the range of mechanisms that should be offered to certain categories of licensees.<sup>11</sup>

Details are enclosed in the section of Enclosure 3 entitled, “Regulatory History of the Parent Company Guarantee.”

Third, disallowing discounts is not expected to have a significant cost impact on licensees. The PCG is less costly than other methods of providing DFA.<sup>12</sup> Exelon issued \$219 million in PCGs in 2010. At the March 2011 workshop, Exelon stated that: “there currently are no direct costs associated with issuing a guarantee.”<sup>13</sup> Exelon also stated that it did not experience any indirect costs for the \$219 million in PCGs that it issued in 2010.<sup>14</sup>

NEI and Exelon stated that the financial test requirement limits the amount of PCGs a parent company can issue. Enclosure 4, which provides responses to comments, discusses cost under the heading, “Comments on Cost.” However, the recently issued Decommissioning Planning Rule will allow intangible assets to be counted toward the financial test, which will allow a significant increase in the amount of PCGs a parent company can issue.<sup>15</sup>

#### Option 2: Allow the Sinking Fund Discount Combination Without Approval, Conditions, or Evaluation of Equivalency

The staff would need to undertake rulemaking to implement this option, because the regulations would need amendment. Prior Commission positions would also require revision.

The requirements of 10 CFR 50.75(b)(1), (b)(3), and (e)(1)(vi) would need amendment. Option 2

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<sup>7</sup> 1998 Decommissioning Rule, 63 FR 50465, 50473

<sup>8</sup> Id.

<sup>9</sup> Id.

<sup>10</sup> 1988 Decommissioning Rule, 53 FR 24018, 24030

<sup>11</sup> 1998 Decommissioning Rule, 63 FR 50465, 50468

<sup>12</sup> 1998 Decommissioning Rule, 63 FR 50465, 50471

<sup>13</sup> Official Transcript of Proceedings, Decommissioning Funding Workshop, Common Sessions, Statement of Mr. Hayes (Exelon Treasury Department) p. 145, US NRC, March 2, 2011 (ML110810747) [Hereinafter Common Sessions Transcript]

<sup>14</sup> Id., Statement of Mr. Hayes (Exelon Treasury Department), p. 195

<sup>15</sup> Decommissioning Planning, Final Rule, 76 FR 35512, 35524, June 17, 2011

does not meet (b)(1) because the amount of DFA actually provided is less than the minimum amount prescribed in § 50.75(c). It does not meet (b)(3) because the combination of the external sinking fund, a discounted PCG, and a commitment to make annual adjustments is not one of the methods specified in § 50.75(e)(1)(i) - (v). It does not meet § 50.75(e)(1)(vi) because it eliminates NRC approval and evaluation for equivalency. Enclosure 3 provides details in the section entitled, "NEI's Discounting Proposal Compared to 10 CFR 50.75."

Two Commission positions would need revision. First, in the PASNY transfer case, the Commission emphasized that reactor licensees must meet the equivalency test when they propose a combination of methods to satisfy the DFA requirements:

[A]s our rules state, a funding arrangement qualifies for approval under [§ 50.75(e)(1)](vi) if it provides a level of decommissioning funding assurance "equivalent" to the level provided by the arrangements set forth in subsections (i) through (v). Applicants may *combine* different mechanisms to achieve this required equivalence. Subsection (vi) itself plainly establishes an "equivalence" test:

(vi) Any other mechanism *or combination of mechanisms*, that provides, as determined by the NRC upon its evaluation of the specific circumstances of each licensee submittal, assurance of decommissioning funding *equivalent* to that provided by the mechanisms specified in paragraphs (e)(1)(i) through (v) of this section.<sup>16</sup> [Emphasis in original]

Second, the Commission determined that the imposition of conditions to the NRC's consent may be required to achieve the requisite equivalent assurance for combinations of methods:

We find that a multitude of provisions in the applications, as conditioned by the NRC Staff, collectively give us the requisite assurance, "equivalent" to the assurance given by the particular funding devices authorized by our rules, that the decommissioning funds will be available to PASNY.<sup>17</sup>

A discussion of the regulation is provided in Enclosure 3 in the section entitled, "Transfer Orders Applying The Equivalency Test of § 50.75(e)(1)(vi)," and the responses to Comments 2 – 5 in Enclosure 4. If this option is selected, rulemaking could address a number of clarification issues and the potential revision of the cost formula in § 50.75(c).

### Option 3: Allow the Sinking Fund Discount Combination with Conditions on Case-by-Case Basis

This option would implement the provisions of § 50.75(e)(1)(vi). If this option is selected, the staff would issue regulatory guidance to establish the process. One factor to consider is the Commission conclusion in the PASNY transfer case that the guarantee method is a "mere promise...to pay the money at some future time," which provides less assurance than money already deposited in a NDT.<sup>18</sup> The noncash nature of the PCG makes it unsuitable for discounting, since it cannot produce any earnings. Enclosure 3 discusses the PCG in the sections entitled, "1998 Decommissioning Rule," and "Vulnerabilities of the PCG and Self-

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<sup>16</sup> 53 NRC 488, 546

<sup>17</sup> Id.

<sup>18</sup> 53 NRC 488, 550

Guarantee.”

A second factor to consider is the incentive provided by the PCG to delay or cease contributions to the NDT. Delaying or ceasing contributions to the NDT may present a significant probability that the NDT will not meet its funding goal. At the March 2, 2011, workshop, an experienced NDT fund advisor presented the results of a Monte Carlo analysis of a hypothetical NDT fund with a shortfall. The probability of successfully meeting the funding goal without adding funds to the NDT ranged from 2/3 down to 1/100, depending on the rate of increase in decommissioning costs.<sup>19</sup> Using Monte Carlo methods to assess the probability of success for a trust fund is discussed in the Enclosure 3 section entitled, “Probability Insights.”

The 2010 transfer of the Zion facility from Exelon to ZionSolutions, LLC (ZS) provides a comparison of NRC DFA requirements to a market-based resolution of the financial risks. Exelon used Monte Carlo analysis to evaluate the financial risks of nonperformance by ZS.<sup>20</sup> Exelon required EnergySolutions, Inc. (ES), parent company of ZS, to provide a PCG that exceeded NRC requirements. The ES guarantee is “absolute, unconditional and irrevocable, and nothing whatever except actual full payment and performance of the Guaranteed Obligations” will satisfy the guarantee.<sup>21</sup> The guarantee has no cap and no discounts. If a shortfall occurs in financial assurance (e.g., the NDT balance does not cover the cost to complete the decommissioning), ZS has 30 days to report the deficiency to Exelon, and 90 days to cure it.<sup>22</sup> The licensee must maintain excess financial assurance starting at 120 percent of the cost estimate and increasing to 200 percent as the project proceeds.<sup>23</sup> The agreement between Exelon and ZS contained many other financial assurance mechanisms. The risks mitigated by the contracts between Exelon and ZS are the same risks that concern stakeholders in local communities, States, and Tribal governments.<sup>24</sup> Enclosure 3 provides details in the section entitled, “Financial Assurance Required by Exelon from ZionSolutions, LLC.”

The evaluation of a discounted PCG would depend on the specifics of each case. However, some broad outlines can be anticipated at this time. In order to mitigate the incentive to delay or cease contributions to the NDT, and consistent with license transfer orders that applied § 50.75(e)(1)(vi), the discounted PCG could be treated as a means to smooth out the cash flow into the NDT over a defined period of time. Consistent with RG 1.159, merchant plant licensees should pay the amount of the discounted PCG into the NDT within two years, and utility licensees within five years, provided that all funds are paid over by the time of permanent shutdown. Government agencies may be allowed longer periods of time to make the payment, if warranted. The discounted PCG should not be permitted after permanent shutdown, when the licensee no longer produces revenue. The regulation provides *up to* a 2 percent real rate of return, it does not guarantee a 2 percent return. The actual real rate of return can be negative when compared to the escalation rate of decommissioning costs. The rate of return is discussed in the Enclosure 3 section entitled, “Rate of Return Compared to Decommissioning Cost Escalation.” Therefore, the licensee would have to justify the discount rate it proposed to use.

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<sup>19</sup> LCG Assoc., Nuclear Decommissioning Trust Asset/Liability Modeling, Slide 18, March 2, 2011 (ML110560778)

<sup>20</sup> Transcript, Decommissioning Funding Workshop, Common Sessions 1 & 2, statement of Mr. Levin (Exelon), March 2, 2011, p.191 (ML110810747)

<sup>21</sup> Application for License Transfers, Enclosure 7, Form of EnergySolutions Performance Guaranty, January 25, 2008 (ML080310521) [Hereinafter Zion Application]

<sup>22</sup> Zion Application, Asset Sale Agreement, Section 6.21.6 (ML080310521)

<sup>23</sup> Zion Application, Credit Support Agreement, Section 2.2 (ML080310521)

<sup>24</sup> State of New York Office of the Attorney General, Issues Related to Decommissioning Funding, March 2, 2011 (ML110560594)

Conditions may be needed to achieve the requisite equivalent assurance.<sup>25</sup> A licensee's commitment to make annual adjustments would not be adequate, since it is not enforceable. The sinking fund discount combination would be conditioned to ensure performance and approved via a license amendment or in an Order, as appropriate. Both methods permit hearing rights, which would provide a venue for public participation. The use of probabilistic methods, such as Monte Carlo analysis, should be developed to risk-inform the evaluations and screen out requests that would significantly increase the probability of funding shortfalls.

RECOMMENDATION:

Option 3 is recommended. This option preserves the flexibility intended when the 1998 Decommissioning Rule was issued. It allows NRC to evaluate licensee requests to determine that the degree of assurance provided by the licensee's proposed method meets the equivalency requirement, and to impose conditions where needed to ensure performance.

COORDINATION:

The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and concurs with requesting resources through the fiscal year 2014 Planning, Budgeting, and Performance Management process. The Office of the General Counsel has reviewed this paper and has no legal objection.

*/RA by Martin J. Virgilio for/*

R. W. Borchardt  
Executive Director  
for Operations

Enclosures:

1. Resources
2. Executive Summary
3. Additional Information
4. Response to Comments
5. Q&A On Financial Assurance
6. Millstone License Transfers

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<sup>25</sup> 53 NRC 488, 546

## RESOURCES

### OPTIONS TO EVALUATE REQUESTS TO USE DISCOUNTED PARENT COMPANY GUARANTEES TO ASSURE FUNDING OF DECOMMISSIONING COSTS FOR POWER REACTORS

Resources are in Thousands. There is no additional funding needed in FY 2012. Resources will be requested through the FY 2014 PBPM Process.

- Option 1: Do not allow the sinking fund discount combination. Issue generic communication to inform licensees that the provisions of 10 CFR 50.75 do not allow discounts to decommissioning financial assurance (DFA).

Pros

- Low cost
- Consistent with regulatory history
- No additional incentive for risk shifting or delaying or ceasing deposits into nuclear decommissioning trust (NDT)

Cons

- May limit parent company guarantee (PCG) capacity for industry
- May limit flexibility of industry to create new DFA methods

Resources: 0.1 FTE, absorb into existing budget.

- Option 2: Allow sinking fund discount combination without approval, conditions, or evaluation of equivalency. Amend regulations and policy through rulemaking. Develop technical basis to risk-inform the regulations to discount the PCG. Include clarification of other issues and potential revision of generic cost formula in 10 CFR 50.75(c).

Pros

- Public process
- Greater consistency by codifying non-standard DFA evaluation process
- Risk-inform regulations
- Clarify existing rules

Cons

- More costly than developing guidance
- Less flexibility to consider non-standard DFA methods

Resources for this option are estimated on the basis that public outreach will be needed, due to the level of interest among stakeholders. In addition to the discounted PCG issue, the rulemaking would address other provisions that should be clarified.

Business Line	Product Line	Product	Work	FY 2014		
				CS&T	FTE	Total
Operating Reactors	Rulemaking	Rulemaking	Regulatory Basis	\$ 300	2.2	\$ 638
			Advanced Notice of Proposed Rule	\$ 100	1.6	\$ 346
			Proposed Rule	\$ 100	1.6	\$ 346
			Final Rule	\$ 100	1.6	\$ 346
<b>Total</b>				<b>\$ 600</b>	<b>7.0</b>	<b>\$ 1,675</b>

The work would start in FY 2014, unless otherwise directed. When we formulate FY 2014, we will include these resources in the budget.

3. Option 3: Allow the sinking fund discount combination with conditions on a case-by-case basis. Issue guidance on evaluating a discounted PCG for equivalency to an existing method in accordance with 10 CFR 50.75(e)(1)(vi). Develop technical basis to risk-inform the evaluation methods.

Pros

- Use existing process for case-by-case approach
- Public process for guidance development
- Greater flexibility than rulemaking
- Technical basis could be used for future rulemaking

Cons

- Cost to develop guidance
- May result in some risk-shifting
- Greater reliance on mitigating risk

Resources:

Due to stakeholder interest, public outreach would be needed.

Business Line	Product Line	Product	Work	FY 2014		
				CS&T	FTE	Total
Operating Reactors	Rulemaking	Rulemaking Support	Technical Basis	\$200	1.0	\$ 354
			Draft Regulatory Guidance	\$ 50	0.5	\$ 127
			Final Regulatory Guidance	\$ 50	0.5	\$ 127
			<b>Total</b>	<b>\$300</b>	<b>2.0</b>	<b>\$ 607</b>

## EXECUTIVE SUMMARY

### OPTIONS TO EVALUATE REQUESTS TO USE DISCOUNTED PARENT COMPANY GUARANTEES TO ASSURE FUNDING OF DECOMMISSIONING COSTS FOR POWER REACTORS

The Nuclear Energy Institute (NEI) requested that NRC grant licensees permission to licensees to use discounted parent company guarantees (PCGs) as financial assurance for decommissioning costs without approval, conditions, or evaluation of equivalency as required by 10 CFR 50.75(e)(1)(vi). NEI proposed that NRC should grant its permission by revising the guidance of Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors." The Commission directed the staff to engage stakeholders and relevant experts in a workshop to develop an option paper on the net present value (NPV) approach for discounting a PCG.

NPV is a tool for appraising the value of long-term projects by discounting estimated future cash inflows and outflows backward in time, which reduces them to today's dollars. The cash flows can be compared to determine if the project will be profitable, assuming the estimates are accurate. NEI proposed to discount the cost of decommissioning, using NPV to determine the size of the discount, and to guarantee the discounted amount using the PCG, in whole or part. A PCG valued in this manner is termed a "discounted PCG." NEI stated that a discounted PCG should be acceptable because earnings credits are permitted for actual funds held in a nuclear decommissioning trust (NDT). With respect to NEI's proposal, the NPV approach may refer to either adding an earnings credit to the PCG or discounting the PCG.

NRC regulations do not allow a discounted PCG to be used by licensees. However, the regulations allow NRC to approve a request to use a non-standard method, such as a discounted PCG, on a case-by-case basis, pursuant to the requirements of § 50.75(e)(1)(vi), if the decommissioning funding assurance (DFA) method(s) provide assurance of decommissioning funding equivalent to that provided by the mechanisms specified in §§ 50.75 (e)(1)(i) through (v). The NRC may impose conditions to achieve the requisite equivalent assurance. Therefore, granting permission to use the discounted PCG without applying the provisions of 10 CFR 50.75(e)(1)(vi) would require rulemaking.

The options for responding to NEI's request are:

1. do not allow the use of discounted PCGs;
2. amend the regulations to allow the use of discounted PCGs without approval, conditions, or evaluation for equivalency; and
3. allow the use of discounted PCGs with conditions on a case-by-case basis under the provisions of 10 CFR 50.75(e)(1)(vi).

The staff recommends Option 3, to allow the use of discounted PCGs with conditions on a case-by-case basis. The following discussion provides background information and summarizes the information presented in the enclosed documents titled Additional Information, Response to Comments, and Questions and Answers on Decommissioning Financial Assurance.

## BACKGROUND

A workshop was held on March 2, 2011, to obtain comments from experts and relevant stakeholders, as directed by the Commission. The March 2011 workshop attracted a distinguished panel of speakers from the financial community, State and Federal agencies, nuclear professionals, and the industry. Presentations included discussion of the NPV approach; the rise in decommissioning costs; historical nuclear decommissioning trust (NDT) performance; the probability of funding success; risks to local communities, States, and tribal governments; and the burden on industry when using the PCG. Participants stated they found range of topics informative and relevant to their issues. A follow-up meeting was held on June 8, 2011, to better understand stakeholder views and to determine the extent of agreement among stakeholders and the NRC.

The meetings produced 13 presentations, 7 written sets of comments, and over 500 pages of transcripts discussing many aspects of the NPV approach and its potential effects on the stakeholder community. In addition to the information developed at the workshops, the staff reviewed the regulatory history since 1988; NRC license transfer cases; Commission memoranda and orders; and licensee decommissioning fund status reports.

The staff also reviewed information from licensee parent company financial reports; filings with the U.S. Securities and Exchange Commission; the use of Monte Carlo analysis by U.S. Federal Reserve for bank stress testing following the 2008 market crisis; generally accepted accounting procedures specified by the Financial Accounting Standards Board; academic articles on investment expectations, Monte Carlo analysis of NDTs, and the financial risks of energy trading; reports by the U.S. Government Accountability Office on the application of Monte Carlo probability methods for assessing the likelihood of success of trust fund investments; financial responsibility regulations issued by other Federal agencies; Federal case law on enforcement of U.S. Environmental Protection Agency financial responsibility regulations; and filings with State Public Service Commissions regarding decommissioning funding.

NEI submitted comments and presentations on 6 occasions since August 2009. NEI requested NRC to allow discounted PCGs. The State of New York Office of the Attorney General submitted comments and presentations on 5 occasions since November 2010. Among other issues, New York requested NRC not to allow discounted PCGs. The State of Vermont Department of Public Service stated that licensees could put money into their NDTs rather than use a PCG.

## DISCUSSION

- NEI's Proposal

In its last comment on NPV discounting, NEI agreed that all combinations of methods of decommissioning financial assurance (DFA), save one, are subject to the equivalency test of 10 CFR 50.75(e)(1)(vi). The exception, according to NEI, is a combination of an external sinking fund, a discounted PCG, and the licensee's commitment to adjust the PCG amount annually to account for changes in decommissioning costs (hereinafter called the "sinking fund discount combination"). NEI stated that the sinking fund discount combination should equal the total amount of funds estimated to be necessary for decommissioning, with the understanding that the total amount would be reduced by a discount calculated using an NPV approach.

- Regulations

A review of the regulatory history verifies that the NRC did not intend nor does the regulation (10 C.F.R. § 50.75) permit discounting of the amount of financial assurance a licensee must provide. The history is discussed in the Additional Information section titled, “Regulatory History of the Parent Company Guarantee.” A legal analysis of the regulatory language in the response to Comment 1 supports the conclusion that NRC had no intent to allow discounting of DFA requirements. The Additional Information section titled, “Cases Applying the Equivalency Test of 10 CFR 50.75(e)(1)(vi),” discusses the Commission’s interpretation of the regulations for evaluating, approving, and placing conditions on DFA methods that are outside the parameters of the existing five methods set forth in 10 CFR 50.75(e)(1)(i) through (v). The Additional Information section titled, “NEI’s Discounting Proposal Compared to 10 CFR 50.75,” describes the reasons NEI’s request does not meet the requirements.

The PCG was requested by licensees and authorized by the NRC for power reactors in 1998 as a low cost method to provide DFA, and to increase flexibility. A number of concerns with the use of the PCG are discussed in the Additional Information section titled, “1998 Decommissioning Rule,” and the section titled, “Vulnerabilities of the PCG and Self-Guarantee.” For example, the PCG provides incentives for licensees to delay or cease contributions to their NDT. In addition, because the PCG is a non-secured promise to pay, without funds or collateral to secure performance, it is vulnerable to the claims of creditors and bankruptcy. As a result of these concerns, conditions would be necessary to assure equivalent DFA in cases where a discounted PCG is approved.

NEI’s final comment on combining DFA methods focused on the use of the external sinking fund in combination with a discounted PCG, which would apply to merchant plant licensees. Interestingly, in response to the 1998 Decommissioning Rule, NEI proposed a framework for DFA that would have extended use of the external sinking fund to a larger number of merchant plant licensees than the regulations would allow, without a requirement for case-by-case evaluation for equivalency of DFA. The NRC declined the proposal on grounds that it would increase the risk of inadequate decommissioning funding. The response to Comment 5 discusses the reasons the external sinking fund is subject to greater oversight when used by a merchant plant licensee.

A number of other comments on the regulations are discussed in the enclosed Comments on Regulations.

- License Transfer Orders Referenced as Precedents

NEI suggested that three license transfer orders provided a precedent that NRC must follow in considering a request to discount the PCG. The NRC staff concluded that the orders were decided in error with respect to DFA, and are not precedents. A discussion of the reasons for concluding the three license transfer orders were erroneously decided is included in the responses to Comments 2 through 4.

However, even if the orders had been correctly decided, the Commission has stated that DFA decisions in license transfer orders have limited value as precedents, especially for non-standard methods of providing DFA:

We see no risk here of a dangerous precedent. In the area of decommissioning funding assurance, each transfer application is examined *on its own facts*. This will be especially true of applications seeking to use an assurance other than those specifically described in sections 50.75(e)(1)(i)-(v). ... Because of the fact-driven nature of our decommissioning rulings in this proceeding, their precedential value is, as a practical matter, limited to an indication of the Commission's openness to funding arrangements not specifically enumerated in subsections (i)-(v).<sup>1</sup> [Emphasis in original]

Thus, the three license transfer orders have no precedential value.

- Zion Facility Financial assurance

The financial assurance arrangements negotiated by Exelon and ZionSolutions for the license transfer of the retired Zion facility are discussed in the Additional Information section titled Financial Assurances Required by Exelon from ZionSolutions, LLC. The parties included extensive financial assurances that exceeded NRC requirements to protect against non-performance of the new licensee. The risks mitigated by their agreements were essentially the same risks that concern stakeholders from local communities, States, and tribal governments.

The financial assurances for the Zion decommissioning include:

- The NDT (\$788 million as of 12/31/2010)
  - \$200 million Letter of Credit (LOC)
  - Unlimited parent company performance guarantee
  - No-cost easement for disposal capacity
  - 90 day time limit to cure a shortfall in financial assurance
  - 120% excess financial assurance at start of decommissioning
  - 200% excess financial assurance of remaining cost before reducing LOC
  - Exelon is protected from any increases in cost due to government requirements
  - Exelon is a member of ZionSolutions, LLC
  - Exelon has the right to appoint a Director to the ZS Board of Directors, with power, among other actions, to block ZS from instituting bankruptcy proceedings
- Historical Data

NDT fund contributions have declined since 1999, the year following the issuance of the 1998 Decommissioning Rule. The enclosed response to Comment 24 discusses the trend. In 2009, approximately 80% of the dollar shortfall of \$2.4 billion occurred at facilities that had delayed or ceased contributions to their NDTs. Shortfalls are discussed in the response to Comment 23.

The regulations allow licensees to take credit for up to a 2% per annum real rate of return on funds held in the NDT. Utility licensees may take credit for a higher real rate of return if authorized by its rate regulatory authority. However, publicly available data suggest that the

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<sup>1</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating, Unit No. 3), CLI-00-14, 53 NRC 488, 550-551 (2001)

actual real rate of return may be less than 2% per annum, and possibly negative, when actual fund performance is compared to the rate of increase of decommissioning costs. Consequently, a request to use a discounted PCG would need to address the licensee's actual real rate of return.

The effects of the 2008 market downturn on the six parent companies whose reactor facilities reported shortfalls in 2009 are shown in the enclosed Additional Information. Their financial performance did not change much during the recession of 2008 – 2009, with the exception of Constellation Energy Group. Constellation experienced large losses in its energy trading program in 2008, and sold a substantial interest in its nuclear business to Électricité de France in 2009.

The table in Enclosure 3 titled, "Nuclear Decommissioning Cost Estimates and Cost Escalation Rates," presents information published by NRC in NUREG-1307, "Report on Waste Burial Charges." The table shows that the compound growth rate of decommissioning costs since 1986 ranges from 4.7% to 9% per annum, depending on reactor type and location. The range exceeds the general inflation rate. This is material because it indicates that the general inflation rate may not be the appropriate measure to determine the real rate of return of a NDT used to provide DFA.

- Probability Insights

The probability that a NDT will reach its target amount is discussed in the Additional Information section titled, "Probability Insights," and the responses to Comments 25 and 26. As expected, the major factors include the rate of return on the investments and the rate of cost escalation. However, delaying or ceasing contributions to the NDT may significantly reduce the probability that the NDT will meet its funding goal. A study of a hypothetical NDT fund with a shortfall estimated that the probability of successfully meeting the funding goal without adding funds to the NDT ranged from 2/3 down to 1/100. Higher rates of increase in decommissioning costs drove down the probability of success. In addition, as shown in a study by the U.S. General Accountability Office (GAO), market volatility can significantly reduce the probability of funding success. Lengthening the time horizon to wait for additional earnings may increase the likelihood of shortfalls. As a result, delaying or ceasing contributions to the NDT, on the assumption that SAFSTOR or license renewal will produce earnings in excess of the rise in decommissioning costs, may not be conservative.

- Costs of the PCG

A number of issues regarding costs are discussed in the enclosed responses to Comments 11 through 19. The conclusion is that minimal costs are incurred to provide a PCG to a licensee-subsiary. A licensee for a large number of reactors stated at the March 2011 workshop that it incurred no direct or indirect costs as a result of issuing \$219 million in PCGs in 2010. NEI and some licensees stated that the financial test required for a PCG places limits on parent company's financial operations. However, the situation is the reverse - the parent company's financial operations limit the amount of PCGs it can issue. If the parent company is unable to pass the financial test for a PCG, the licensee can choose another DFA method that does not require passing a financial test.

- Other Comments

NEI stated that a number of presentations and comments from the stakeholder community mischaracterize the NRC's regulations, are incorrect and misleading, not germane to the issue, or have no value. See the responses to Comment 7, 20, 22 and 24 for a discussion.

- Questions and Answers on Decommissioning Financial Assurance

Questions and answers on NPV, the earnings credit, the PCG, and related topics are included.

ADDITIONAL INFORMATION

OPTIONS TO EVALUATE REQUESTS TO USE DISCOUNTED PARENT COMPANY  
GUARANTEES TO ASSURE FUNDING OF DECOMMISSIONING COSTS  
FOR POWER REACTORS

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## REGULATORY HISTORY OF THE PARENT COMPANY GUARANTEE

On five occasions in the past, NRC used the rulemaking process to address use of the parent company guarantee (PCG) and the closely related self-guarantee.<sup>1</sup> NRC issued final rules in 1988,<sup>2</sup> 1993,<sup>3</sup> 1998,<sup>4</sup> 2002,<sup>5</sup> and 2011.<sup>6</sup> The NRC has never allowed, and no commenter has ever requested, discounts to the PCG or adding an earnings credit to the PCG in any rulemaking proceeding. The NRC determined that the cost of using the PCG, as well as all other decommissioning financial assurance (DFA) methods, was equitable:

[T]he Commission believes that the rule is an equitable means of requiring reasonable assurance of funding for decommissioning without imposing an undue burden on licensees.<sup>7</sup>

Two themes recur throughout the regulatory history regarding the PCG method: (1) it was requested by licensees and permitted by NRC on the basis of its low cost and flexibility, and (2) it has always been subject to greater restrictions than other DFA methods to achieve an adequate degree of assurance that funds will be available when needed.

### 1988 Decommissioning Rule

In 1988, the NRC issued regulations that first established the requirement to provide DFA. The purpose of the amendments was to assure that decommissioning will be carried out with minimal impact on public and occupational health and safety and the environment. The NRC was particularly concerned with financial assurance:

Inadequate or untimely consideration of decommissioning, specifically in the areas of planning and financial assurance, could result in significant adverse health, safety, and environmental impacts.<sup>8</sup>

Four methods of DFA were allowed for power reactors: prepayment; an external sinking fund which required annual deposits; a surety method or insurance; and, for government licensees, a statement of intent to obtain funds.<sup>9</sup> Power reactor DFA was unique in several ways. Only power reactors were: (1) required to certify that they would recalculate the amount of DFA annually to account for cost escalation; (2) allowed to build up their external sinking fund over time; (3) explicitly forbidden from providing financial assurance less than the prescribed amount; and (4) forbidden from using the PCG.

<sup>1</sup> The self-guarantee has a more stringent financial test as compared to the PCG, but is substantially similar in other respects. *Compare* Appendix A To Part 30 - Parent Company Guarantees to Appendix C To Part 30 - Self Guarantees

<sup>2</sup> General Requirements for Decommissioning Nuclear Facilities, Final Rule, 53 FR 24018, July 27, 1988 [Hereinafter the 1988 Decommissioning Rule]

<sup>3</sup> Self-Guarantee as an Additional Financial Assurance Mechanism, Final Rule, December 29, 1993, 58 FR 68726 [Hereinafter the 1993 Self-Guarantee Rule]

<sup>4</sup> Financial Assurance Requirements for Decommissioning Nuclear Power Reactors, Final Rule, 63 FR 50465, September 22, 1998 [Hereinafter the 1998 Decommissioning Rule]

<sup>5</sup> Decommissioning Trust Provisions, Final Rule, Dec. 24, 2002, 67 FR 78332 [Hereinafter 2002 Decommissioning Trust Rule]

<sup>6</sup> Decommissioning Planning, Final Rule, June 17, 2011, 76 FR 35512 [Hereinafter 2011 Decommissioning Planning Rule]

<sup>7</sup> 1988 Decommissioning Rule, 53 FR 24018, 24038

<sup>8</sup> 1988 Decommissioning Rule, 53 FR 24018, 24019

<sup>9</sup> See 10 CFR 50.75(e)(3) [1998] At the time, all power reactors were electric utility licensees.

All licensees except research and test reactors (RTRs) are required to certify that they provided DFA in an amount required by the regulations. For each type of licensee, except RTRs, a minimum amount is defined, termed the “prescribed” amount. Materials licensees have the option to certify to a lower amount than the minimum prescribed amount, if they prepare an acceptable site-specific cost estimate that demonstrated they could decommissioning for a lower cost.<sup>10</sup>

However, power reactors are forbidden from certifying DFA in an amount less than the prescribed amount in § 50.75(c). The prohibition is written into the language of § 50.75(b)(1), which states that DFA must be “provided in an amount which may be more, but not less, than the amount stated in the table in paragraph (c)(1) of this section adjusted using a rate at least equal to that stated in paragraph (c)(2) of this section.” The reason for the prohibition is that the prescribed amount is not expected to actually cover the cost of decommissioning. It is simply a reference amount, based on cost studies, which would provide the “bulk” of decommissioning costs.<sup>11</sup> The regulation states explicitly that the prescribed amount of paragraph (c) is not to be used by other agencies to establish rates.<sup>12</sup> In view of the expectation that the prescribed amount of § 50.75(c) will not cover the cost of decommissioning, a proposal to lower the amount of DFA provided by the licensee would be expected to increase the risk that decommissioning obligations will not be adequately funded.

During the rulemaking process, comments were received from all classes of licensees, except power reactors, supporting the use of the PCG. The NRC had not originally intended to allow the PCG for any class of licensee. The NRC stated that it did not include the financial test in the proposed rule because the PCG would not provide sufficient assurance of funds for decommissioning due to the potential for changing financial conditions and the lengthy time period before decommissioning would take place.<sup>13</sup> However, the NRC recognized that the financial test could be useful in some situations and could minimize impacts on the licensees.<sup>14</sup> The PCG was allowed for all classes of licensees, except power reactors. A number of restrictions were placed on its use: (1) the PCG was required to cover the entire cost of decommissioning;<sup>15</sup> (2) it was not allowed to be combined with any other method; (3) the guarantor had to pass a financial test, and (4) the test had to be repeated every year.

All licensees were allowed to combine the methods at their discretion, with the exception that the PCG could not be combined with other methods. This general authorization to combine methods was changed for power reactors in the 1998 Decommissioning Rule.

### 1993 Self-Guarantee Rule

In 1993, the NRC issued regulations to allow all licensees, except power reactors, to use the self-guarantee method as DFA.<sup>16</sup> The self-guarantee has a financial test substantially similar to

<sup>10</sup> 1988 Decommissioning Rule 53 FR 24018, 24035

<sup>11</sup> Id. 53 FR 24030

<sup>12</sup> 10 CFR 50.75(a), “The requirements of this section, in particular paragraph (c) of this section, are in addition to, and not substitution for, other requirements, and are not intended to be used by themselves or by other agencies to establish rates.”

<sup>13</sup> 1988 Decommissioning Rule 53 FR 24018, 24035

<sup>14</sup> Id.

<sup>15</sup> The entire cost requirement follows from the text of the PCG provisions in Appendix A to Part 30. It is also explained in footnote 2 in the 1998 Decommissioning Rule at 63 FR 50465, 50473

<sup>16</sup> 1993 Self-Guarantee Rule, 58 FR 68726

the PCG, but imposes higher tangible net worth and credit rating requirements.<sup>17</sup> In this rulemaking, power reactors commenters requested the NRC to extend the use of the self-guarantee to them. The Commission refused on grounds that the objective of the self-guarantee was to reduce the licensee's cost burden without causing adverse effects on public health and safety. The NRC already allowed power reactor licensees to accumulate decommissioning funds in an external sinking fund. Thus, electric utilities already were permitted a cost-reducing financial assurance mechanism.<sup>18</sup>

### 1998 Decommissioning Rule

In 1998, the NRC issued a rule to respond to the potential rate deregulation of the electric power generating industry.<sup>19</sup> The rulemaking was particularly relevant to the PCG issue, and provided several significant cost-reducing amendments for power reactors, as well as providing more flexibility in choosing DFA mechanisms. However, the 1998 Decommissioning Rule contains no mention of discounting or taking an earnings credit for the PCG.

The 1998 Decommissioning Rule significantly amended the 1988 rules for reactors by

- (1) allowing an earnings credit for actual funds protected in a NDT,<sup>20</sup>
- (2) removing the prohibition against power reactors using the PCG,<sup>21</sup>
- (3) allowing the PCG to be used in combinations,<sup>22</sup>
- (4) removing power reactor licensee discretion to combine DFA methods and requiring case-by-case evaluation of combinations and non-standard DFA mechanisms,
- (4) restricting the use of the external sinking fund,
- (5) eliminating the requirement to make annual deposits into the external sinking fund,
- (6) relaxing the prepayment requirement,
- (7) explicitly reserving the right to modify the schedule of accumulation of funds,
- (8) adding additional DFA methods to increase the flexibility of the rule, and
- (9) requiring a decommissioning fund status report.

A number of changes in 1998 Decommissioning Rule recognized that merchant plant licensees could be confronted with “quite large” shortfalls due to the loss of guaranteed revenues from ratepayers. By allowing an earnings credit on NDT funds held in the prepayment mechanism, merchant plant licensees were allowed to significantly reduce the up-front cost of providing DFA. Unlike materials licensees, who are required to place the entire amount needed into a prepaid account, merchant plant licensees could meet their requirement with just partial up-front payment. The difference between the actual amount in the prepaid NDT and the required amount of DFA could be made up by taking a credit for anticipated future earnings on the NDT funds. In the event the earnings credit was not adequate to meet the prescribed amount, then the PCG could be used as a supplement. Letters of credit and surety bonds could also be used as supplements, however, the NRC stated that PCGs and self-guarantees were less costly than other methods.<sup>23</sup> The authorization for reactors to use the PCG decreased the cost and increased the flexibility of the NRC's DFA rules for power reactors.

<sup>17</sup> Compare Appendix A To Part 30 - Criteria Relating to Use of Financial Tests and Parent Company Guarantees for Providing Reasonable Assurance Of Funds For Decommissioning to Appendix C To Part 30 - Criteria Relating To Use of Financial Tests and Self Guarantees for Providing Reasonable Assurance of Funds for Decommissioning

<sup>18</sup> 1993 Self-Guarantee Rule, 58 FR 68626, 68727

<sup>19</sup> 1998 Decommissioning Rule, 63 FR 50465

<sup>20</sup> Id. at 63 FR 50465

<sup>21</sup> Id. at 63 FR 50481

<sup>22</sup> Id. at 63 FR 50473

<sup>23</sup> Id. at 63 FR 50471

Commenters on the 1998 Decommissioning Rule generally endorsed parent company guarantees and self-guarantees as a reasonable method of assurance for power reactor licensees no longer meeting the definition of “electric utility.”<sup>24</sup> Some commenters felt the financial test for the PCG would be burdensome. NRC responded that the financial test was based on a test developed by the US Environmental Protection Agency (EPA). The EPA test was used to assess the financial condition of firms managing hazardous waste that were seeking to assure closure and post-closure care obligations that were substantially smaller than typical decommissioning costs for power reactors. The NRC stated that the financial test was questionable when used for reactor licensees due the large decommissioning costs of reactors.<sup>25</sup> However, NRC did not amend the financial test before adopting it.

The flexibility of the PCG for reactor DFA use was greatly increased by allowing it to be used in combination with other methods. To accomplish that purpose, the previous requirement that the PCG must cover the entire cost of decommissioning was eliminated for reactors. That change allowed the PCG to be written for a portion, rather than the whole, of the DFA requirement, thus making it suitable for use in combinations. Along with changes to the PCG, the 1998 Decommissioning Rule eliminated the requirement for annual deposits into the NDT, which enhanced the usefulness of the PCG. However, the 1998 Decommissioning Rule identified three concerns for using a PCG or a self-guarantee for reactor DFA, particularly where they are used in combination with other methods:<sup>26</sup>

- Questionable applicability of the financial test
- Incentive to shift costs and avoid greater responsibility
- Incentive to delay or cease contributions to the NDT

To address those concerns, the Commission required case-by-case evaluations of combinations of methods, particularly those with the PCG, and other non-standard methods. The need for the requirement is explained in the Supplementary Information of the 1998 Rule:

Although the external sinking fund, standing alone, is not allowed for the licensees losing such regulatory oversight, the NRC framework also offers opportunities for case-by-case consideration of non-standard financial assurance arrangements. Examples include § 50.75(e)(1)[(vi)], which allows unspecified, other guarantee methods; and certain contractual arrangements in § 50.75(e)(1)[(v)].<sup>27</sup>

In addition, the applicability of the NRC’s parent company guarantees and self-guarantees to power reactor licensees is questionable ... because the underlying financial tests were developed primarily for other types of entities assuring smaller decommissioning obligations. Consequently, a case-by-case approach, through which reactor licensees that lose the ability to recover decommissioning costs through regulated rates or other mandatory charges established by a regulatory body, could provide assurance equivalent to the other methods that the NRC is allowing. However, the NRC will need to ensure that the mechanisms used will, in fact, provide adequate

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<sup>24</sup> Id. at 63 FR 50470

<sup>25</sup> Id. at 63 FR 50473, referring to 50470

<sup>26</sup> 1998 Decommissioning Rule, 63 FR 50465, 50473

<sup>27</sup> 1998 Decommissioning Rule at 63 FR 50469. Typographical errors in the 1998 Decommissioning Rule *Federal Register* Notice were corrected in 63 FR 57236. The text shown uses the corrected citations to the requirements.

financial assurance.<sup>28</sup>

Because of the low costs of guarantees, however, allowing this combination of mechanisms could create an incentive for licensees to delay or cease payments into the sinking fund and, instead, to rely on the guarantee for as much of the cost as possible. Given the magnitude of typical decommissioning costs for reactors, this possibility could hinder the timely conduct of decommissioning. In other words, decommissioning could be significantly delayed if, because of a licensee's inadequate contributions to its sinking fund, a guarantor had to come up with large amounts of money at the time of decommissioning.<sup>29</sup>

In sum, the NRC has eliminated the prohibition on combining parent company or self-guarantees with external sinking funds. The NRC will also consider other combinations of mechanisms on a case-by-case basis when the aforementioned concerns are addressed.<sup>30</sup>

Before 1998 Decommissioning Rule was issued, substituting the low-cost, non-cash PCG for deposits into the NDT was not possible. However, the 1998 Decommissioning rule eliminated the requirement to make annual deposits in the NDT, and permitted the PCG to be combined with a NDT. However, the NRC did not change the requirement to have the funds available for decommissioning at the time termination of operations was expected.<sup>31</sup> The Commission explained the need for requiring all funds to be available at the time termination of operations was expected in an earlier rulemaking:

This requirement was imposed to avoid a situation where lack of funds could delay and degrade the decommissioning process to the detriment of public health and safety. Although the dismantlement process can be completed in discrete stages, the potential unavailability of funds at a later stage may conceivably affect the dismantlement process at an earlier stage by creating incentives to "cut corners."<sup>32</sup>

To assure achievement of the funding requirement in view of the incentives to delay or cease contributions into the NDTs, and the incentive to shift costs, the NRC required a case-by-case evaluation for any combination of methods and non-standard methods of providing DFA to verify that they provided an equivalent degree of assurance as compared to the methods described in § 50.75(e)(1)(i) through (v) under the specific circumstances of the licensee's submittal.

Interestingly, in response to the 1998 Decommissioning Rule, NEI proposed a framework for DFA that would have extended use of the external sinking fund to a larger number of merchant plant licensees than the regulations would allow, without a requirement for case-by-case evaluation for equivalency of DFA. The NRC declined the proposal on grounds that it would increase the risk of inadequate decommissioning funding. The response to Comment 8 discusses the reasons the external sinking fund is subject to greater oversight when used by a merchant plant licensee.<sup>33</sup>

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<sup>28</sup> Id. at 63 FR 50473

<sup>29</sup> Id.

<sup>30</sup> Id.

<sup>31</sup> § 50.75(e)(1)(i) and (ii)

<sup>32</sup> Decommissioning Funding for Prematurely Shutdown Power Reactors, Final Rule, 57 FR 30383, 30385

<sup>33</sup> Id. at 63 FR 50469

To summarize, the 1998 Decommissioning Rule significantly amended the rules for reactors. They gained several cost-reducing methods and greater flexibility in choosing financial assurance methods. NRC considered and rejected a comment to allow the use of the external sinking fund for merchant plant licensees without case-by-case evaluation for equivalency of DFA. However, although benefitting from the changes made in allowable financial assurance methods, reactor licensees lost the discretion to combine methods at will. The need to restrict licensee discretion arose from concern for the adequacy of reactor DFA in view of the economic deregulation of the industry. The concerns followed two general themes. First, concerns were expressed regarding the potential effects of increased competition on merchant plants. Second, the expanded use for the PCG raised concerns. The Commission expressed the two themes in the following statement:

Making riskier financial assurance mechanisms available to riskier licensees compounds risk to the public that adequate funds will not be available when needed. Thus, prudent public policy may limit the range of mechanisms that should be offered to certain categories of licensees.<sup>34</sup>

In recognition of the greater risks, NRC codified a number of measures that worked together to limit the risk to the public and provide NRC with greater oversight authority. The decommissioning fund status report was imposed to allow NRC to monitor performance.<sup>35</sup> The NRC extended its monitoring authority to allow a review the licensee's performance at any time.<sup>36</sup> To address cases where monitoring revealed that the licensee had not provided adequate financial assurance, the NRC reserved the right to modify the schedule of accumulation of funds, either in cooperation with the rate making authority or on its own.<sup>37</sup> The elimination of licensee discretion to combine methods at will ensured that the degree of assurance would not be allowed to decrease below the levels established in the rules.<sup>38</sup>

### 2002 Decommissioning Trust Rule

In 2002, NRC issued a rule that required merchant plant licensees to revise their NDT agreements to increase the assurance that adequate funds will be available when needed for decommissioning.<sup>39</sup> The rulemaking included a draft revision to RG 1.159 which, among other items, made changes to the PCG agreement.<sup>40</sup> The changes to the PCG agreement were made to conform to the 1998 Decommissioning Rule that allowed the PCG to be issued as partial satisfaction of the decommissioning financial assurance (DFA) requirement, when combined with another method. In particular, the PCG amount could be less than the total decommissioning cost.<sup>41</sup> However, the NRC did not allow, and no commenter requested, discounting the PCG or adding an earnings credit to it.

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<sup>34</sup> 1998 Decommissioning Rule, 63 FR 50465, 50468

<sup>35</sup> § 50.75(f)(1)

<sup>36</sup> § 50.75(e)(2)

<sup>37</sup> § 50.75(e)(2)

<sup>38</sup> § 50.75(e)(1)(vi)

<sup>39</sup> 2001 Decommissioning Trust Rule, 67 FR 78332

<sup>40</sup> Id. 67 FR 78332 - 33

<sup>41</sup> RG 1.159, Rev. 1, "Assuring The Availability of Funds for Decommissioning Nuclear Reactors," p. 1.159-57 October 2003

## 2011 Decommissioning Planning Rule

In 2011, NRC issued the Decommissioning Planning Rule which, among other things, amended the financial test of the PCG and self-guarantee.<sup>42</sup> The proposed rule was issued in 2008 requesting comments on, among other items, changes to the PCG financial test.<sup>43</sup> The time period of the rulemaking proceeding overlapped with the time period of the power reactor industry's efforts to obtain discounts for the PCG. However, no licensee or industry representative requested NRC to add an earnings credit to the PCG, or to allow discounts when using a PCG, or stated that the cost of the PCG was unduly burdensome to the industry.

Two changes were made to the financial test of the PCG. The minimum amount of tangible net worth was raised from \$10 million to \$21 million to account for inflation. More significantly, licensees were allowed to use intangible assets to meet a total net worth ratio. This contrasted with the previous test, which excluded intangible assets, and based the ratio on tangible net worth only. This change significantly increases the amount of PCGs a parent company can issue. To the extent that the financial test has some effect on the licensee or its parent company, the 2011 rule provides significant relief.

One of the goals of the 2011 rule was to change the financial assurance rules in 10 CFR Parts 30, 40, 70, and 72 to achieve greater consistency with 10 CFR Part 50 regulations.<sup>44</sup> To meet that goal, NRC revised the PCG rules to provide materials licensees opting to use the external sinking fund with the same degree of flexibility that power reactor licensees have had since 1998 (in a final rulemaking for power reactor financial assurance, the NRC allowed use of a parent company guarantee in combination with an external sinking fund.)<sup>45</sup> In the development of the technical basis for the revision, the NRC found no provisions to allow either discounting or taking an earnings credit for the PCG. As a result, there was no need to revise NUREG-1757, Vol.15, which states that no credit is taken for earnings on any financial assurance mechanism (e.g., a parent company guarantee) that does not set aside actual funds as prepayment.<sup>46</sup>

## Summary of Regulatory History

In summary, the PCG was authorized as a DFA method in order to reduce cost and increase flexibility for the licensees. The regulatory history shows a complete absence of any intention or permission to discount the PCG or add an earnings credit to the PCG. In the course of 23 years of rulemaking on the subject, no commenter requested discounts or earnings credits for the PCG. However, the NRC identified a number of adverse incentives the PCG provided to reactor licensees as a result of the permission to combine the PCG with other methods. To mitigate those incentives, and in contrast to all other classes of licensees, the NRC created a case-by-case process to evaluate requests from reactor licensees to combine methods or use non-standard methods of DFA. In order to obtain NRC approval for a discounted PCG, the licensee must demonstrate that the specific circumstances of its submittal provides assurance equivalent to the existing methods specified in § 50.75(e)(1)(i) through (v).

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<sup>42</sup> 2011 Decommissioning Planning Rule, 76 FR 35512, 35524

<sup>43</sup> Decommissioning Planning, Proposed Rule, January 22, 2008, 73 FR 3812

<sup>44</sup> 2011 Decommissioning Planning Rule, 76 FR 35512, 35517

<sup>45</sup> Id.

<sup>46</sup> Consolidated NMSS Decommissioning Guidance Financial Assurance, Recordkeeping, and Timeliness NUREG-1757, Vol. 15, Section 4.3.2.10, September 2003

The financial test for the PCG was revised in 2011 to allow intangible assets to be used to meet a total net worth test for the PCG. The change significantly increases the amount of PCGs a parent company can issue.

#### NEI'S DISCOUNTING PROPOSAL COMPARED TO 10 CFR 50.75

NEI proposed that power reactor licensees should be allowed to use a discounted PCG to meet the requirements for DFA. The amount of the discounted PCG would be calculated using the net present value (NPV) approach.<sup>47</sup> NEI stated that the discounted PCG would be combined with the licensee's commitment to make annual adjustments to the discounted PCG.<sup>48</sup> The following discussion recites the evolution of the proposal since it was first introduced in September 2009. The discussion then considers whether the request may be granted without approval under the equivalency test of § 50.75(e)(1)(vi). It concludes that the proposed method must be approved by NRC under the equivalency test.

NEI's first request, in its September 2009 letter, was to revise the NRC's regulatory guidance to allow licensees to discount the DFA requirement using the NPV approach without NRC approval.<sup>49</sup> The September 2009 letter referred to the "current value," which was defined as the amount that would be necessary to put in a fund today to assure full decommissioning funding at the time of plant shutdown. NEI later clarified that it was requesting an NPV discount.<sup>50</sup> In August 2010, NEI stated that the NPV approach should be used to allow discounts to the PCG, in combination with an annual readjustment of the amount needed to cover the gap between the prepaid funds and the amount of DFA required.<sup>51</sup> NEI stated the combination was equivalent to cash held in a NDT.<sup>52</sup>

NEI stated in its March 2011 letter that the licensee is not required to obtain approval under the equivalency test provisions of § 50.75(e)(1)(vi) when it takes a discount on the DFA requirement.<sup>53</sup> The March 2011 letter stated that § 50.75(e)(1)(iii)(B) allowed discounting the PCG and no approval was required.<sup>54</sup> However, in its final comments submitted in the July 2011 letter, NEI agreed that all combinations of methods, save one, are subject to the equivalency test of § 50.75(e)(1)(vi).<sup>55</sup> The stated exception is a combination of an external sinking fund, a discounted PCG, and the licensee's commitment to adjust the PCG amount annually to account for changes in decommissioning costs (hereinafter called the "sinking fund discount combination").<sup>56</sup> NEI stated that the sinking fund discount combination should equal the total amount of funds estimated to be necessary for decommissioning, with the understanding that the total amount would be reduced by a discount calculated using an NPV approach. Details of NEI's reasoning for distinguishing the sinking fund discount combination

<sup>47</sup> NEI, SECY-10-0084: Explanation of Changes to Revision 2 to Regulatory Guide 1.159, p.7, August 4, 2010, (ML103220332) [Hereinafter NEI August 2010 letter]

<sup>48</sup> NEI, Industry Comments on June 8 Workshop, p.10, July 13, 2011 (ML11196A203) [Hereinafter NEI July 2011 letter]

<sup>49</sup> NEI, Industry comments on NRC's Draft Regulatory Guide DG-1229, Enclosure 1, Revision 1, p.10-12, September 10, 2009 (ML092590128) [Hereinafter NEI September 2009 letter]

<sup>50</sup> NEI August 2010 letter at 7

<sup>51</sup> NEI August 2010 letter at 7-8

<sup>52</sup> NEI August 2010 letter at 8

<sup>53</sup> NEI, Concerns Regarding the Conduct of the US Nuclear Regulatory Commission's March 2 Decommissioning Funding Workshop. p.1, March 8, 2011 (ML11069016) [Hereinafter NEI March 2011 letter]

<sup>54</sup> Id.

<sup>55</sup> NEI, Industry Comments on June 8 Workshop, p.10, July 13, 2011 (ML11196A203)

<sup>56</sup> Id. at 9

as an exception to the equivalency test are discussed in the response to Comment 8.

In earlier comments, NEI offered two examples to illustrate its discounting proposal. In its first example, NEI referred to the three license transfer orders as precedents for approving discounted PCGS.<sup>57</sup> The three license transfer orders used a combination of a discounted PCG, a prepaid account, and a condition to annually adjust the discounted amount. The second example was a hypothetical new reactor application, where the proposed combination was a discounted PCG and a commitment to annually adjust the amount. The DFA requirement and NEI's proposed discounted PCG amount the Millstone license transfer order and a new reactor are shown below.

Millstone license transfer <sup>58</sup>	Shortfall from § 50.75 requirement	\$77 million
	Discounted PCG amount	\$26 million
New reactor example <sup>59</sup>	§ 50.75 requirement	\$405 million
	Discounted PCG amount	\$171 million

NEI stated that it was not proposing to use a discounted PCG standing alone:

[W]e're not saying that we are relying somehow on the static parent company guarantee to magically grow. I agree with you, that wouldn't make any sense, but we are updating it annually ....<sup>60</sup>

In both examples, NEI proposed that a discounted PCG, if it used, would be combined with a commitment by the licensee to adjust the discounted amount annually. In the Millstone license transfer, the discounted PCG was combined with a commitment to make annual adjustments and a prepaid account. In the new reactor example, the discounted PCG would be combined only with a commitment to make annual adjustments.

Now recall that NEI's July 2011 letter agreed that all combinations, except the external sinking fund and a PCG, require NRC approval under the equivalency test. Neither of the examples shown above falls within the exception NEI would carve out from the requirement for evaluation and approval pursuant to the equivalency test of § 50.75(e)(1)(vi).

However, the regulatory structure does not allow any combination of methods to be used by a reactor licensee without approval by the NRC on the basis of the equivalency test of § 50.75(e)(1)(vi). The equivalency test applies to the combination of an external sinking fund and a PCG, as well as all other combinations. The applicable regulatory requirements are stated below:

§ 50.75 (b) Each power reactor ...  
 (1) ... [must certify] that financial assurance for decommissioning will be (for a license applicant), or has been (for a license holder), provided in an amount which may be more, but not less, than the amount stated in the table in

<sup>57</sup> NEI September 2009 letter at 11 (ML092590128)

<sup>58</sup> See response to Comment 2, enclosed, for calculation of shortfall and discounted PCG amount.

<sup>59</sup> NEI, SECY-10-0084: Explanation of Changes to Revision 2 to Regulatory Guide 1.159, p.9, August 4, 2010 (ML103220332)

<sup>60</sup> Transcript, Decommissioning Funding Workshop, Common Sessions, statement of Ms. Kass (NEI), March 2, 2011, p.111 (ML110810747)

paragraph (c)(1) of this section adjusted using a rate at least equal to that stated in paragraph (c)(2) of this section.

...

(3) The amount must be covered by one or more of the methods described in paragraph (e) of this section as acceptable to the NRC.

§ 50.75(e)(1)(vi) Any other mechanism, or combination of mechanisms, that provides, *as determined by the NRC upon its evaluation of the specific circumstances of each licensee submittal, assurance of decommissioning funding equivalent to that provided by the mechanisms specified in paragraphs (e)(1)(i) through (v) of this section.* Licensees who do not have sources of funding described in paragraph (e)(1)(ii) of this section may use an external sinking fund in combination with a guarantee mechanism, as specified in paragraph (e)(1)(iii) of this section, provided that the total amount of funds estimated to be necessary for decommissioning is assured. [Emphasis added]

NEI's proposal, even in the limited form of the sinking fund discount combination, does not meet the requirements of 10 CFR 50.75(b)(1), (b)(3), or (e)(1)(vi). It does not meet (b)(1) because it is less than the minimum prescribed amount of § 50.75(c).<sup>61</sup> It does not meet (b)(3) because the combination of the discounted PCG with a commitment to make annual adjustments is not specifically described in § 50.75(e)(1)(i) - (v). It does not meet § 50.75(e)(1)(vi) because it eliminates NRC approval and evaluation for equivalency on a case-by-case basis.

However, NEI's proposal may be considered under § 50.75(e)(1)(vi). The proper application of the regulation was the subject of a Commission Memorandum and Order. In the 2001 license transfer of Fitzpatrick and Indian Point Unit 3 from the Power Authority of the State of New York (PASNY) to Entergy Nuclear Operations (PASNY transfer order) the Commission explained that § 50.75(e)(1)(vi) provides a process for the licensee to request approval of methods not otherwise allowed in the regulations:

[It is] the Commission's intention to at least consider, on a case-by-case basis, funding assurance mechanisms not expressly permitted under subsections [§ 50.75(e)(1)](i) through (v). In promulgating subsection [§ 50.75(e)(1)](vi), we intended to give applicants the flexibility necessary to structure methods outside the parameters of any one of the five methods set forth in subsections (i) through (v) or to combine portions of those subsections in such a way as to provide the same end-result of funding assurance.<sup>62</sup>

The Commission emphasized in the PASNY transfer order that reactor licensees must meet the equivalency test when they propose a combination of methods to satisfy the DFA requirements:

Rather, as our rules state, a funding arrangement qualifies for approval under subsection (vi) if it provides a level of decommissioning funding assurance equivalent to the level provided by the arrangements set forth in subsections (i) through (v). Applicants may *combine* different mechanisms to achieve this

<sup>61</sup> In some cases, the discounted PCG may cover the shortfall, as noted in Enclosure 4 in the response to Comment 2. However, even where adequate to cover the shortfall, the discounted guarantee as proposed by NEI still fails to meet the requirements of § 50.75(b)(1) and (e)(1)(vi).

<sup>62</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating Unit No. 3), CLI-00-14, 53 NRC 488, 550-551 (2001) [Hereinafter 53 NRC 488]

required equivalence. Subsection (vi) itself plainly establishes an equivalence test.

(vi) Any other mechanism *or combination of mechanisms*, that provides, as determined by the NRC upon its evaluation of the specific circumstances of each licensee submittal, assurance of decommissioning funding *equivalent* to that provided by the mechanisms specified in paragraphs (e)(1)(i) through (v) of this section.<sup>63</sup> [Emphasis in original]

The Commission's statement does not carve out an exception for combinations of a PCG with an external sinking fund. Consequently, the sinking fund discount combination is required to be tested for equivalency. The response to Comment 8 provides further discussion of the reasons that a combination using the external sinking fund requires NRC approval under the equivalency test.

In its adjudication of the PASNY transfer order, the Commission described the guarantee as a "mere promise ... to pay the money at some future time," which provides less assurance than money already deposited in a NDT.<sup>64</sup> Given that a non-discounted PCG does not provide financial assurance equivalent to money in a NDT, it logically follows that a discounted PCG would not achieve equivalency either.

A licensee's commitment would not be adequate since commitments are not enforceable. The Commission stated that the requisite equivalent assurance of decommissioning funding under § 50.75(e)(1)(vi) is provided collectively by the licensee's assurance provisions and the NRC staff's conditions.<sup>65</sup> Consequently, conditions may be imposed to ensure licensee performance. In past orders where § 50.75(e)(1)(vi) was used to approve non-standard methods, conditions were imposed to ensure performance. Conditions could be imposed in an order issued pursuant to the authority of § 50.75(e)(2), or in a license amendment. Both methods would permit hearings rights, which would provide a venue for public participation.

## REGULATORY GUIDANCE

No regulatory guidance for reactors has been issued stating that adding an earnings credit or applying a discount to a PCG or self-guarantee is an acceptable means of meeting the regulatory requirements for either reactors or materials licensees.

In the PASNY transfer, the Commission stated that the end result of funding assurance was stated in NUREG-1577, Rev. 1:

Third-party guarantee mechanisms, such as surety bonds or letters of credit, should guarantee the total amount of currently estimated decommissioning costs. If these mechanisms are used in combination with other assurance mechanisms, *the combined amount should at least equal current estimated decommissioning costs.*<sup>66</sup> [Emphasis in original]

<sup>63</sup> 53 NRC 488, 546

<sup>64</sup> 53 NRC 488, 550

<sup>65</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating Unit No. 3), CLI-00-14, 53 NRC 488, 546 (2001)

<sup>66</sup> Id. at 551, quoting NUREG-1577, Rev. 1, Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance, Section 2.f(2)

The criterion in NUREG-1577, Rev. 1 does not recognize a discounted PCG as an acceptable method to meet the regulatory requirement.

The Guidance of RG 1.159, Rev. 1, states:

2.1.2 The applicant or licensee should indicate that the method used provides, or will provide at the projected cessation of operations, an amount at least equal to the estimated or certified decommissioning cost for the facility, when earnings are taken into account as permitted by 10 CFR 50.75(e)(1)(i) and (ii). If a licensee uses a combination of different methods for assuring decommissioning funds, the combined total of the methods being used should equal the certification amount, plus adjustments projected to be needed.<sup>67</sup>

RG 1.159 recognizes the applicability of earnings credits only for the prepaid account and external sinking fund methods specified in 10 CFR 50.75(e)(1)(i) and (ii). It does not recognize taking an earnings credit for or giving a discount to a PCG as an acceptable method to meet the requirements. It states the combined total should at least equal the certification amount, which is the minimum DFA amount defined in § 50.75(c). It does not state that a smaller, discounted amount is acceptable.

An interesting conclusion can be drawn from NEI's September 2009 request to revise RG 1.159 to remove existing guidance stating that a combination should equal the certification amount. NEI's request is reproduced below. The existing guidance that NEI wanted to eliminate is shown in strikeout form. NEI's proposed addition, which changes the meaning of what constitutes the total amount, is shown in underline form:

2.1.2 The applicant or licensee should indicate that the method used provides, or will provide at the projected cessation of operations, an amount at least equal to the estimated or certified decommissioning cost for the facility, when earnings are taken into account as permitted by 10 CFR 50.75(e)(1)(i) and (ii).~~If a licensee uses a combination of different methods for assuring decommissioning funds, the combined total of the methods being used should equal the certification amount, plus adjustments projected to be needed.~~ If a licensee uses a combination of different methods for assuring decommissioning funds, the combined total of the methods being used should equal the current value of the certification amount.<sup>68</sup>

NEI defined the "current value" as amount that would be necessary to put in a fund today to meet the minimum DFA requirement.<sup>69</sup> However, the "current value" is not the certification amount calculated by the formula of § 50.75(c). Using the definition proposed by NEI, the "current value" is the discounted amount of certification requirement of § 50.75(c), which is less than the certification amount. The requested strike out and insertion demonstrates NEI's conclusion that the NRC's existing guidance would have to be changed to be compatible with the discounting method proposed by NEI. The change would be necessary because the existing guidance conflicts with giving a discount on the DFA requirement. The existing guidance, shown in strikeout form, has been unchanged since it was originally issued in 1990.

<sup>67</sup> RG 1.159, Rev. 1, "Assuring The Availability of Funds for Decommissioning Nuclear Reactors," p. 1.159-11, October 2003

<sup>68</sup> NEI September 2009 letter at 12

<sup>69</sup> Id. at 11

The persistence of the guidance provides additional support for the conclusion that the NRC did not intend to allow discounting when the financial assurance rules were first issued in 1988, and that the intention has not changed since that time.

Likewise, guidance for materials licensees has always stated that only non-discounted PCGs are acceptable. Materials licensee guidance for PCGs was first issued in 1990.<sup>70</sup> The early guidance stated that a PCG, if used, must at least equal the decommissioning cost of the facility.<sup>71</sup> Revised regulatory guidance for materials licensees was issued in September 2000 to clarify that no earnings credit could be taken for a PCG.<sup>72</sup> The materials guidance for PCGs was last revised in 2003 and issued in NUREG-1757, Vol.15. The 2003 guidance states:

No credit is taken for earnings on any financial assurance mechanism (e.g., a parent company guarantee) that does not set aside actual funds as prepayment<sup>73</sup>

#### PRECEDENTS OF NON-DISCOUNTED PCGS

The requirements for the PCG and the closely related self-guarantee are specified in Appendices A and C to 10 CFR Part 30, respectively. In every instance where the regulations authorize the PCG or self-guarantee for use, the regulation refers to Appendix A or C, respectively, as its authoritative basis.<sup>74</sup> As discussed in the response to Comment 1, that common basis establishes a general rule for all reactor and materials licensees using the PCG of self-guarantee as a DFA method. Appendices A and C to Part 30 do not authorize licensees to give an earnings credit to, or take a discount for, a PCG or self-guarantee.

Since 1988, PCGs and self-guarantees have been approved for dozens of reactor and materials licensees.<sup>75</sup> When annual requalification is considered, over 200 guarantees have been approved without allowing an earnings credit or a discount. For example, self-guarantees covering four research and test reactors (RTRs) have been approved each year since 1993. In every instance, the guarantee did not allow discounting. Numerous non-discounted PCGs for reactors were also approved. For example, in 2003, NRC accepted non-discounted PCGs from Progress Energy in the amount of \$276 million, to cover shortfalls at three units until license renewal could be obtained.<sup>76</sup> In 2009, NRC accepted only non-discounted PCGs to meet DFA requirements at 5 facilities. In 2011, the NRC accepted non-discounted PCGs to cover shortfalls at two facilities. As discussed in the response to Comment 2, of the three license transfer orders referred to as precedents by NEI, only two approved PCGs that did not cover the shortfall, while the PCG in the third order was adequate to cover the shortfall.

With respect to the amount of time needed to prepare and submit a PCG, there are now two examples demonstrating that 90 days is achievable by licensees. As stated in SECY-10-0084, Progress Energy submitted three non-discounted PCGs to cover shortfalls of \$276 million at three of its nuclear facilities when it submitted its decommissioning fund status (DFS) report in

<sup>70</sup> Standard Format And Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, And 72, Regulatory Guide 3.66, June 1990

<sup>71</sup> Id. Section 3.2

<sup>72</sup> NMSS Decommissioning Standard Review Plan, NUREG-1727, Section 15.3.3.10, September 2000

<sup>73</sup> Consolidated NMSS Decommissioning Guidance Financial Assurance, Recordkeeping, and Timeliness NUREG-1757, Vol. 15, Section 4.3.2.10, September 2003

<sup>74</sup> See § 30.35, § 40.36, § 50.75, § 70.25, § 72.30

<sup>75</sup> Financial Assurance Inventory Log, Office of Federal and State Materials and Environmental Management Programs (FSME); Decommissioning fund status reports, Office of Nuclear Reactor Regulation

<sup>76</sup> Biennial Decommissioning Funding Status Report, p. 2, Progress Energy, March 28, 2003 (ML030970280)

2003. Recently, FirstEnergy Nuclear Operating Company stated in its 2011 DFS report that it would submit non-discounted PCGs to cover shortfalls of \$95 million at two of its facilities, within 90 days of the date of its DFS submittal.

#### TRANSFER ORDERS APPLYING THE EQUIVALENCY TEST OF § 50.75(e)(1)(vi)

NRC has applied § 50.75(e)(1)(vi) in a number of license transfer orders to approve using a non-standard financial mechanism, subject to a number of conditions. Typically, the conditions required funds to be deposited into the licensee's NDT within a defined time period and assured the integrity of the funds during the time period before the funds were deposited.

In response to a contention admitted in the of the Fitzpatrick and Indian Point Unit 3 license transfer from the Power Authority of the State of New York to Entergy Nuclear Operations, Inc., the Commission explained the meaning of § 50.75(e)(1)(vi):

In promulgating subsection (vi), we intended to give applicants the flexibility necessary to structure methods outside the parameters of any one of the five methods set forth in subsections (i) through (v), or to combine portions of those subsections in such a way as to provide the same end-result of funding assurance.<sup>77</sup>

However, the Commission stated that even where the reactor licensee provides extensive provisions in its application, the NRC may impose conditions to achieve the requisite equivalent assurance:

We find that a multitude of provisions in the applications, as conditioned by the NRC Staff, collectively give us the requisite assurance, "equivalent" to the assurance given by the particular funding devices authorized by our rules, that the decommissioning funds will be available to PASNY. The extensive protective measures set forth in the applications satisfy us regarding the integrity and sufficiency of the PASNY - Entergy decommissioning funding arrangements.<sup>78</sup>

The Commission emphasized that reactor licensees must meet the equivalency test when they propose a combination of methods to satisfy the DFA requirements:

[A]s our rules state, a funding arrangement qualifies for approval under [§ 50.75(e)(1)](vi) if it provides a level of decommissioning funding assurance "equivalent" to the level provided by the arrangements set forth in subsections (i) through (v). Applicants may *combine* different mechanisms to achieve this required equivalence. Subsection (vi) itself plainly establishes an "equivalence" test:

(vi) Any other mechanism *or combination of mechanisms*, that provides, as determined by the NRC upon its evaluation of the specific circumstances of each licensee submittal, assurance of decommissioning funding *equivalent* to that provided by the mechanisms specified in paragraphs (e)(1)(i) through (v) of this section.<sup>79</sup> [Emphasis in original]

<sup>77</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating, Unit No. 3), CLI-00-14, 53 NRC 488, 550-551 (2001)

<sup>78</sup> Id. at 546

<sup>79</sup> Id. at 546

In the event a non-standard mechanism approved by the NRC is challenged, the licensee bears the burden to show that it meets the safety standards of the regulations:

Where (as here) an adjudication goes to hearing, it is Applicants' burden to show, by a preponderance of the evidence, that they meet our safety standards - in this case, our financial qualifications rule.<sup>80</sup>

The Commission stated that DFA decisions in license transfer orders have limited value as precedents, especially for non-standard methods of providing DFA:

We see no risk here of a dangerous precedent. In the area of decommissioning funding assurance, each transfer application is examined *on its own facts*. This will be especially true of applications seeking to use an assurance other than those specifically described in sections 50.75(e)(1)(i)-(v). ... Because of the fact-driven nature of our decommissioning rulings in this proceeding, their precedential value is, as a practical matter, limited to an indication of the Commission's openness to funding arrangements not specifically enumerated in subsections (i)-(v).<sup>81</sup> [Emphasis in original]

The Commission stated that a guarantee provided less assurance than an NDT:

[T]he financial assurance at issue here is actually *greater* than that provided by a surety or parent - Applicants' assurance takes the form of money that has already been deposited in the two funds, as opposed to a mere promise of a surety, guarantee, or insurance policy to pay the money at some future time.<sup>82</sup>

Four license transfer orders that included evaluations under § 50.75(e)(1)(vi) to accept non-standard financial methods for DFA are outlined below. A tabulation of the four orders is in the table titled, "Application of 10 CFR 50.75(e)(1)(vi) to Previous License Transfer Orders."

In each application, the non-standard DFA involved funds held in a NDT by a former licensee, which were kept for a period of time before turning over to the new licensee. The specific circumstances of the applications included strong protections of the NDT, enforceable requirements to pay over the funds at the agreed upon time, and continuing government oversight of the funds while being held by the non-licensee. Tax issues provided the motivation to offer the non-standard methods. Where the non-licensee was a private company, the holding time was relatively short, around 1 year. Government agencies were allowed to hold the funds until the time of decommissioning. The funds equaled or exceeded the total DFA required. The non-licensees remained under State government oversight, which would assure the funds were not spent on other purposes, contracts were in place to require payment to the new licensee, and the NDTs had trustees to preserve the funds.

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<sup>80</sup> Id. at 517

<sup>81</sup> Id. at 556-557

<sup>82</sup> Id. at 550

### Application of 10 CFR 50.75(e)(1)(vi) to Previous License Transfer Orders

Reactor Facility	Status of NDT Holder	Non-Standard Mechanism Approved	Specific Circumstance
Indian Point Unit 3 <sup>83</sup>	Government agency	Maintain NDT until decommissioning	Avoid capital gains tax; strong NDT protections
Crystal River Unit 3 <sup>84</sup>	Government agency	Maintain NDT until decommissioning	Resolve tax issues; strong NDT protections
Three Mile Island Unit 1 <sup>85</sup>	Private company	Temporary holding of NDT for about 1 year	Resolve tax issues; strong NDT protections
Hope Creek <sup>86</sup>	Private company	Temporary holding of NDT for about 1 year	Resolve tax issues; strong NDT protections

Order Approving Transfer of License from the Power Authority of the State Of New York (PASNY) to Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc. and Approving Conforming Amendment, November 9, 2000, (ML003767953)

Entergy wanted to avoid any risk of having to pay capital gains tax on the funds accumulated by PASNY to decommission Indian Point Unit 3 (IP3). The parties agreed that PASNY would continue to hold the funds in the decommissioning trust until such time as IP3 is decommissioned, when the funds would be disbursed to Entergy. The arrangement was acceptable under § 50.75(e)(1)(vi) for the following reasons: (1) PASNY fund held \$308.4 million, which exceeded the \$280 million required under the generic cost formula of § 50.75(c), even without taking the 2% earnings credit; (2) the trust is not subject to the claims of PASNY's creditors; (3) PASNY held a very strong AA bond rating, which reduced the potential for long-term default; (4) modifications to the trust agreement; (5) PASNY waived right to challenge NRC jurisdiction regarding use of the decommissioning trust funds; (6) fiduciary duties of the trustee provided additional assurance that funds will remain available; (7) the money needed is already set aside in trust; (8) PASNY is a political subdivision of the State of New York, which provides assurance that the contracts between PASNY and Entergy will remain in force.

A contention was submitted challenging the DFA methods approved in this order. The results of the Commission's adjudication are detailed in the preceding paragraphs of this section.

Order Approving the Transfer of License for Crystal River Unit 3 to the Extent Held by the City of Tallahassee to Florida Power Corporation and Approving Conforming Amendment, September 8, 1999 (ML020670117)

The City of Tallahassee (City) (1.3333% owner-licensee) sold its interest to Florida Power Corporation (FPC). The parties agreed that City would continue to hold the decommissioning trust funds accumulated to date, rather than transfer the funds to FPC. City's tax-exempt status made it likely that fund accumulation would be greater if left with the City. When the funds are needed for decommissioning, the City will disburse them to FPC. FPC's trust fund held \$309.7

<sup>83</sup> ML003767953

<sup>84</sup> ML020670117

<sup>85</sup> ACN# 9905180206

<sup>86</sup> ML003683613

million, which exceeded the \$261.9 million estimated cost of decommissioning. The arrangement was acceptable under § 50.75(e)(1)(vi) for the following reasons: (1) the available funds exceeded 10 CFR 50.75 requirement, even without the City's decommissioning trust funds; (2) the City is able to set its own rates and has an assured source of revenue for decommissioning; and (3) the City agreed to pay over trust funds to FPC when needed for decommissioning.

Safety Evaluation Transfer of Three Mile Island Unit 1 from General Public Utilities, Inc. to Amergen Energy Company, LLC, April 12, 1999 (ACN# 9905180206)

The parties agreed that GPU would hold the decommissioning trust it had accumulated for Three Mile Island Unit 1 (TMI 1) until the US Internal Revenue Service made a decision on the tax status of the transferred funds, when the funds would be transferred to Amergen. The arrangement was acceptable under § 50.75(e)(1)(vi) for the following reasons: (1) the amount in the fund (\$303 to \$320 million), depending on the sale closing date, exceeded the generic formula amount (\$269 million); (2) GPU voluntarily accepted NRC jurisdiction over the fund while held by GPU; (3) GPU could pass the financial test for a parent company guarantee; (4) the funds set aside are specifically provided for the decommissioning obligation; (5) fiduciary duties of the trustee provide assurance that the funds will be reserved for decommissioning; (6) GPU will remain a regulated utility and the New Jersey Public Utilities Commission will assure the fund will not be used for any purpose other than decommissioning; (7) GPU is contractually obligated to pay over the funds to Amergen; (8) the arrangement is only temporary.

Order Approving the Transfer of License for Hope Creek Generating Station, to the Extent Held by Public Service Electric and Gas Company, to PSEG Nuclear Limited Liability Company and Approving Conforming Amendment, February 16, 2000 (ML003683613)

In accordance with a Summary Order from the New Jersey Public Service Commission, Public Service Electric and Gas Company (PSE&G) transferred its licenses to a newly formed nuclear generation affiliate, PSEG Nuclear. The new affiliate would own and operate Hope Creek and Salem, and own a share of the Peach Bottom units, but not operate them. However, PSE&G wanted to hold the trust funds for some time after the license transfer to resolve tax issues. Thus, PSEG Nuclear would not meet the DFA requirements at the time of transfer. The arrangement was acceptable under § 50.75(e)(1)(vi) for the following reasons: (1) funds would be adequate for decommissioning at time of shutdown based on receipt of non-bypassable charges and the earnings credit; (2) PSE&G would pass the financial test to pay the \$514.7 million held in the trust funds at the time of the transfer; (3) actual possession of the funds specifically set aside to pay the obligation exceeds the requirement for a surety company; (4) trust agreement provides additional assurance that funds will be used for decommissioning; (5) PSE&G would remain a public utility, and New Jersey was not likely to allow the funds to be used for other than decommissioning purposes; (6) the arrangement is only temporary, until the tax issue is resolved.

#### VULNERABILITIES OF THE PCG AND SELF-GUARANTEE

The PCG and self-guarantee are subject to a number of vulnerabilities when used as financial assurance mechanisms. First, there is no requirement to set aside funds, or to provide security for the guaranteed amount. The parent company is not required to hold funds to pay the guarantee in a segregated account outside the parent company's control. Consequently, the assets that would be called upon to pay the guarantee, if needed, are subject to attachment by

creditors, can be pledged as collateral for other purposes, may be lost in unprofitable business ventures, and are vulnerable in bankruptcy. Unlike a bank, insurance company, or surety, the parent company is not an independent third party, and it can be affected by financial stress of its subsidiary-licensee, while the subsidiary-licensee can be affected by the financial stress of its parent. As a result, the parent and licensee may be subject to a common mode financial risk. The self-guarantee has similar risks, but is directly affected by the licensee's financial stress.

In addition to the financial risks involved, the PCG raises certain adverse incentives, as discussed in the regulatory history section of this paper. Briefly, the PCG provides incentives to delay or cease deposits into the NDTs, and to shift costs. (See the section on the 1998 Decommissioning Rule for a discussion of adverse incentives.) A discounted PCG provides a lower level of assurance than a non-discounted PCG by the fact that it covers a lower amount of the decommissioning costs, which may result in a shortfall in DFA. It provides a greater opportunity to take advantage of the adverse incentives provided by the non-discounted PCG by virtue of its lower effective ratio of assets and net worth to the decommissioning cost. The Commission stated that the guarantee method, which represents a promise to pay at some time in the future, provides less assurance than funds already deposited and protected in a decommissioning trust.<sup>87</sup>

#### FINANCIAL ASSURANCES REQUIRED BY EXELON FROM ZIONSOLUTIONS, LLC

The 2010 transfer of the Zion facility from Exelon to ZionSolutions, Inc. (ZS) provides a comparison of NRC DFA requirements to a market-based resolution of the financial risks of non-performance of decommissioning by the licensee. It shows how knowledgeable industry participants with experience in managing risk apportioned the financial risks of non-performance of decommissioning. It provides the first instance of a merchant plant that must depend on the NDT as the only source of funding. As shown below, Exelon required EnergySolutions, Inc. to accept all the risk and to provide comprehensive financial assurances. The risks identified and mitigated by the financial assurance agreements between Exelon and EnergySolutions, Inc. are the same risks that concern stakeholders in local communities, the States, and tribal governments.

When Exelon sold its Zion facility to Energy Solutions, Inc. (ES) in 2010, it retained ownership of the land. ES created ZionSolutions, LLC (ZS) to decommission the Zion facility in exchange for the accumulated funds in the Zion NDT. As part of its due diligence, Exelon first used a Monte Carlo analysis to assess the financial risks it faced by depending on ES to perform the project.<sup>88</sup> Exelon then transferred the risks to ES and ZS through an extensive set of financial assurances. Exelon explained that it "expect[ed] them [ZS] to eat into their profits a little bit before they finished the job completely."<sup>89</sup> To assure performance, ES was required to provide a PCG to ZS that exceeded NRC requirements. The ES guarantee is "absolute, unconditional and irrevocable, and nothing whatever except actual full payment and performance of the Guaranteed Obligations" will satisfy the guarantee.<sup>90</sup> The guarantee has no cap and no discounts. Exelon also required EnergySolutions to provide 7.5 million cubic feet of disposal

<sup>87</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating Unit No. 3), CLI-00-14, 53 NRC 488, 550 (2001)

<sup>88</sup> Transcript, Follow-up Meeting, Statement of Mr. Levin (Exelon), June 8, 2011, p.110 (ML111650033)

<sup>89</sup> Id.

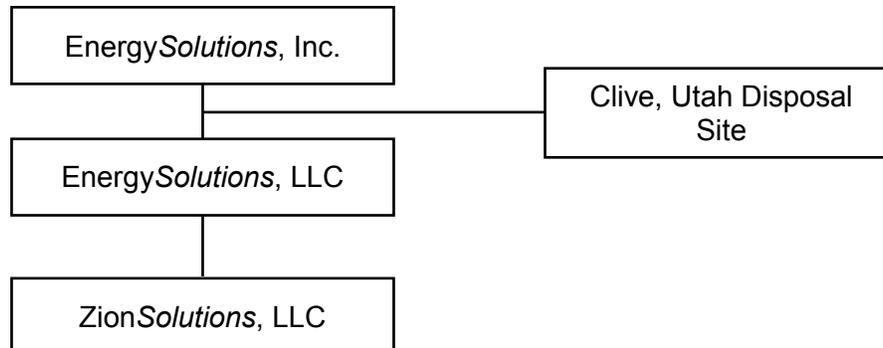
<sup>90</sup> Application for License Transfers, Enclosure 7, Form of EnergySolutions Performance Guaranty, January 25, 2008 (ML080310521) [Hereinafter Zion Application]

capacity with “no fee, charge, or other cost.”<sup>91</sup> The guaranteed capacity is 125% of the estimated disposal volume needed to complete the project.<sup>92</sup> In addition, Exelon has a place on the licensee’s Board of Directors, with the right to block the licensee from instituting a bankruptcy proceeding.<sup>93</sup> Exercising that right would force ZS to keep its workforce in place and force ES to pay for decommissioning, despite insolvency on ZS’s part.

The parties agreed that the NDT was adequate to pay for the decommissioning. However, Exelon required ZionSolutions to obtain an additional \$200 million letter of credit. Exelon stated that the \$200 million was “just additional insurance that we at Exelon felt we needed to have in order to convince all of our parties that we were in good shape to go forward.”<sup>94</sup>

The illustration below shows the corporate structure governing the Zion facility licensee. ZionSolutions, LLC (ZS) holds the Zion license, and must meet the decommissioning obligations specified by the NRC. EnergySolutions, LLC is an intermediate parent company, and EnergySolutions, Inc. (ES, Inc. or ES) is the parent. The structure is designed to give ZS “bankruptcy remoteness” from financial distress of the parents and other affiliated companies. Among other items, bankruptcy remoteness means that ZS cannot file for bankruptcy without the consent of Exelon. The guarantees that ES, Inc. was required to provide to Exelon assures that any financial distress of ZS will be borne by ES, Inc. Ownership of the Clive, Utah disposal site figured prominently in the agreement, because it enabled Exelon to obtain an easement for cost-free disposal capacity, thus guaranteeing zero increases in disposal costs.

#### EnergySolutions Corporate Structure for Zion Decommissioning



The financial assurances required of ZS and its parents included the following agreements:

- Parent Company Performance Guaranty
- Irrevocable Easement for Disposal Capacity
- Asset Sale Agreement
- Credit Support Agreement
- Limited Liability Agreement of ZionSolutions, LLC

<sup>91</sup> Zion Application, Exhibit G, Irrevocable Easement for Disposal Capacity..

<sup>92</sup> Zion Nuclear Power Station Units 1 and 2 Amended Post-Shutdown Decommissioning Activities Report, March 17, 2008, p.14 (ML080840398)

<sup>93</sup> Zion Application, Limited Liability Company Agreement of ZionSolutions, LLC, Sec. 9(d)(iii), Management, and Schedule A, Definitions, “Material Action”

<sup>94</sup> Transcript, Decommissioning Funding Workshop, Common Sessions, statement of Mr. Levin, March 2, 2011, p.191 (ML110810747)

### Parent Company Performance Guaranty<sup>95</sup>

The corporate structure normally protects the parent from incurring any liability for the obligations of its subsidiaries. The principle that a parent company has no liability for the acts of its subsidiary is recognized by the United States Supreme Court:

It is a general principle of corporate law deeply “ingrained in our economic and legal systems” that a parent corporation (so-called because of control through ownership of another corporation’s stock) is not liable for the acts of its subsidiaries.<sup>96</sup> *United States v. Bestfoods*, 524 U.S. 51, 61 (1998)

In the Zion case, the parent - subsidiary relationship would shield ES from liabilities attaching to ZS, if ZS failed to complete the Zion facility decommissioning. However, Exelon required ES and ZS to establish a parent guaranty that would pierce the shield provided by corporate law. The guaranty exceeds the requirements of the NRC’s PCG, and it passes ZS’s liabilities up through the corporate chain directly to ES, Inc. One of the limitations of the NRC’s PCG is that the parent can make payment under the PCG and absolve itself of any further liability for the performance of the decommissioning. The Zion guaranty removes that limitation by requiring ES, Inc. and ES, LLC to absolutely, unconditionally, and irrevocably guarantee both payment and performance. As a result, ES, Inc. is responsible for any cost overruns by ZS, and must pay whatever it takes to complete the decommissioning. Relevant sections of the guaranty agreement are shown below, with emphasis added to highlight the extent of the guaranty.

Section 2. Guaranty. As an inducement to Beneficiary[Exelon], for and in consideration of Beneficiary entering into the Asset Sale Agreement, Guarantor [ES, Inc. and ES, LLC] hereby absolutely, unconditionally, and irrevocably guarantees to Beneficiary and its successors, endorsees and permitted assigns, as primary obligor and not merely as a surety, the full and prompt payment and performance, when due, by Counterparty [ZS] of all of its present and future obligations that are required to be paid or performed in accordance with the Guaranteed Agreements (collectively, the "Guaranteed Obligations"). The Guaranteed Obligations shall include, without limitation, all reasonable costs and expenses (including reasonable attorneys' fees and disbursements), if any, incurred in enforcing Beneficiary's [Exelon] rights under this Guaranty, but only to the extent that Beneficiary is successful in enforcing its legal rights under this Guaranty. *This is a guaranty of payment and performance and not of collection.* [Emphasis added]

Section 3. Guaranty Absolute. The liability of Guarantor [ES, Inc. and ES, LLC] under this Guaranty shall be absolute, unconditional and irrevocable, and nothing whatever except actual full payment and performance of the Guaranteed Obligations (and all other debts, obligations and liabilities of Guarantor under this Guaranty) shall operate to discharge Guarantor's liability hereunder. [Emphasis added]

Section 3 continues with 15 subsections that require ES, Inc. and ES, LLC to waive the legal defenses that would otherwise be available to contest the enforcement of the guaranty. The

<sup>95</sup> Zion License Transfer Application, Enclosure 7, January 25, 2008 (ML080310521)

<sup>96</sup> *United States v. Bestfoods*, 524 U.S. 51, 61 (1998)

first waiver is an anti-bankruptcy clause that requires ES to pay under the guaranty, regardless of the outcome of any bankruptcy proceeding. The final waiver is a catch-all to cover anything that wasn't already named in the list. The list is summarized below.

- 3.1 Any event of bankruptcy, reorganization, or insolvency, even if the Bankruptcy Court disallows any claim by Exelon or requires Exelon to return any payment as a fraudulent transfer under the Bankruptcy Code
- 3.2 Any amendment to the Guaranteed Agreements, except for amendments that materially increase ES's liability and ES does not consent, if consent is required
- 3.3 Exercise, non-exercise, or delay in exercising any right under Agreement
- 3.4 Any change or waiver of any term of the Guaranteed Obligations
- 3.5 Any assignment or transfer of rights under the Guaranty by Exelon, including use as security for financing
- 3.6 Any merger or change in corporate existence or cessation of the existence of ES or ZS
- 3.7 Any change in ownership or control of ES or ZS
- 3.8 Any sale or transfer of ES interests in ZS
- 3.9 Inaccuracy or breach of any representations or warranties by ZS or Exelon
- 3.10 Failure to create, perfect, or protect any security interest or collateral
- 3.11 The existence, release, settlement or compromise of any security or collateral or failure to enforce such guaranty
- 3.12 The existence of any claim or other rights which ES may have against Exelon
- 3.13 The validity of this Guaranty, the Guaranteed Agreements, or any provision of law purporting to prohibit payment or performance by ZS
- 3.14 The absence of any notice to, or knowledge by, ES of the existence or occurrence of any of the matters or events set forth in the foregoing clauses
- 3.15 Except as provided herein, any other circumstances which might otherwise constitute a defense to, or discharge of, ES or ZS in respect of the Guaranteed Obligations or a legal or equitable discharge of ZS in respect thereof, including, a discharge as a result of any bankruptcy or similar law.

Section 4 adds more waivers of legal defense, including waiving ES's right to obtain reimbursement of expenses from its subsidiary, ZS. The list is summarized below.

- 4.1 ES irrevocably, unconditionally and expressly waives any action, benefit, or advantage that may delay, prevent, or otherwise affect ES's performance of its obligations, or enforcement by Exelon, of the terms of the Guaranty
- 4.2 ES irrevocably, unconditionally and expressly waives all notices of every kind, including any fact that might materially increase the risk to ES, that are not specifically required under the Guaranteed Obligations, and waives the benefit of all provisions of law that are in conflict with the Guaranty
- 4.3 ES irrevocably, unconditionally and expressly waives promptness of any notice and any requirement that Exelon must protect any security, or first proceed against ZS or any other Person or guaranty
- 4.4 ES irrevocably, unconditionally and expressly waives (i) any right to bring a case against ZS; (ii) any subrogation of rights of Exelon against ZS until the Guaranteed Obligations have been paid and performed in full; (iii) any setoffs or claims against Exelon or ZS that would impair Exelon's rights against ES; and (iv) any right of reimbursement by ZS
- 4.5 Notwithstanding, ES shall be entitled to defenses based on termination of the

Agreement if ZS is not in breach or the failure of Exelon to perform its obligation under the Agreement that adversely affects ZS's performance

In the event that the guarantees prove insufficient, despite their comprehensiveness, Section 8 states that Exelon can require ES, Inc. to provide additional instruments upon written demand:

Section 8. Continuing Guarantee. Guarantor [ES] agrees, upon the written request of Beneficiary, to execute and deliver to Beneficiary any additional instruments or documents necessary or advisable from time to time, in the reasonable and good faith opinion of Beneficiary [Exelon], to cause this Guaranty to be, become or remain valid and effective in accordance with its terms.

The comprehensive nature of the Zion parent guarantee can be assessed using a checklist developed by Moody's Investors Service to evaluate whether a guarantee is sufficiently strong to accept the parent's credit rating as guarantor for the subsidiary.<sup>97</sup> To achieve pass through of the parent's credit, the guarantee must assure that the parent will not assert any defense to payment. Moody's identifies 9 characteristics of the ideal guarantee to achieve credit substitution. The Zion guaranty displays all 9 characteristics. On the other hand, the NRC PCG agreement explicitly covers only one the characteristics – it is enforceable by virtue of the guarantor's signature. However, the NRC PCG is not irrevocable or unconditional, and it does not have the explicit listing of waivers of legal defenses found in the Zion guaranty.

#### Irrevocable Easement for Disposal Capacity<sup>98</sup>

In its application, ES, Inc. stated that it could guarantee zero increases in disposal costs by virtue of its ownership of the Clive, Utah radioactive waste disposal site. The agreement with Exelon included an irrevocable easement to 7.5 million cubic feet of disposal capacity. The easement guaranteed that the capacity would be available with no fee, charge, or other cost. The grant of easement added a 25% contingency, or 1.5 million cubic feet, to the expected waste volume of 6 million cubic feet.

Three significant terms of the easement substantially reduced the risk of cost overruns in the Zion case. First, the easement was granted to Exelon. As the landowner, Exelon faced the risk that ZS may fail to complete the decommissioning project. In that event, Exelon would become the unwilling possessor of radioactive material on its property and would have to complete the decommissioning at its own expense. The grant of the easement to Exelon guaranteed that if ZS did not complete the project, then any radioactive material remaining could be disposed of at no charge in the Clive, Utah disposal site. Second, the easement could be assigned by Exelon to another company that might take over the Zion decommissioning project if ZS failed and its interests were sold to another party to complete the project. The third term provided that the covenants run with the land. As a result, any subsequent owner of the Clive Site would be bound by the same covenants, regardless of the fate of ES, Inc. The several terms working in concert assure that disposal capacity at no charge will be available to radioactive waste from the Zion decommissioning whether or not ZS and ES perform, or even cease to exist. (Note Section 3.6 of the guaranty, listed above, specifically waived ZS and ES's defenses based on cessation of existence.)

<sup>97</sup> Moody's Investors Service, NRC Decommissioning Workshop, Appendix: Credit Substitution, March 2, 2011 (ML110560780)

<sup>98</sup> Zion License Transfer Application, Asset Sale Agreement, Appendix G, January 25, 2008 (ML080310521)

### Asset Sale Agreement

The Asset Sale Agreement defines numerous obligations for the parties. Of interest are the requirements that protect Exelon from increasing costs, Exelon's control of disbursements, and the requirement to mitigate shortfalls within 90 days.

Exelon protected itself against possible increases in decommissioning costs in Section 6.18 of the Asset Sale Agreement:

In the event that the NRC, the ICC [Illinois Commerce Commission] or other Governmental Authority requires Buyer [ZS] to provide Decommissioning funding assurance in an amount in excess of the Decommissioning Funds, Buyer, Buyer's Parent [ES, LLC] and/or Guarantor [ES, Inc.] (or such other entity as shall be acceptable to the NRC) shall post a guaranty or other financial assurances or take such other action as is sufficient to cover such excess Decommissioning funding in such form as required by the such Governmental Authority.

Section 6.21.7 allows Exelon to control the disbursement of funds from the NDT to pay for decommissioning costs; however, such payment may occur only after the expenses have been paid or are due and payable in cash:

Buyer [ZS] shall not request a disbursement ... if Buyer has not paid for such materials or services or Buyer's obligation to pay for such materials or services is not due and payable in cash.

Section 6.21.5 and 6.21.6 provide a procedure to be followed if the projected expenses exceed the remaining funds in the NDT. In that case, ZS must submit a "Deficiency Certification" to Exelon identifying the shortfall within 30 days. For reference, NRC licensees report the status of their NDT funds every two years, or annually, if in decommissioning or involved in a merger or acquisition. Under Section 6.21.6, ZS has 90 days to mitigate the shortfall. ZS has three choices: (1) reduce its cost to complete the decommissioning; (2) increase the amount of financial assurance by using a letter of credit; (3) defer any additional reimbursement of costs until the remaining costs are covered by the NDT. For reference, the guidance of RG 1.159 states that is acceptable for a merchant plant licensee to mitigate the shortfall two years after notification, and for public utility licensees to take five years.

### Credit Support Agreement<sup>99</sup>

NRC regulations require the licensee to provide assurance at any time during the life of the facility, through termination of the license, that adequate funds will be available to complete decommissioning.<sup>100</sup> Exelon imposed requirements on ZS that exceeded the NRC requirement to provide adequate funds.

The NRC requires that the decommissioning cost estimate must be covered. In the Zion case, ZS was required to provide financial assurance in excess of the cost estimate. Although the parties agreed that the NDT funds were adequate to complete the decommissioning project,

<sup>99</sup> Zion License Transfer Application, Asset Sale Agreement, Exhibit F, January 25, 2008 (ML080310521)

<sup>100</sup> Decommissioning of Nuclear Power Reactors, Final rule, July 29, 1996, 61 FR 39278

Exelon required ES, Inc. to provide an additional \$200 million letter of credit (LOC) in Section 2.1.1 of the Credit Support Agreement.<sup>101</sup> Exelon stated that the \$200 million was “just additional insurance that we at Exelon felt we needed to have in order to convince all of our parties that we were in good shape to go forward.”<sup>102</sup> The LOC requirement forced ZS to provide financial assurance of about 120% of the original cost estimate of \$978 million.<sup>103</sup>

Exelon will permit ZS to reduce the LOC as the work progresses and the remaining cost to complete decommissioning decreases. However, in Section 2.2 of the Credit Support Agreement, Exelon required ZS to maintain financial assurance equal to 200% of the remaining costs before any reduction can be made to the LOC. After any reduction, the sum of the face amount of the LOC and the NDT must be at least 200% of the remaining costs. The funds in the NDT must be at least 100% of the remaining costs. These conditions forbid ZS from substituting the LOC for funds in the NDT.

The effect of the two conditions in Sections 2.1.1 and 2.2 of the Credit Support Agreement is that ZS must provide 120% of the cost estimate to begin the project, and the percentage will increase to 200% of the remaining cost as the work progresses.

#### Limited Liability Agreement of ZionSolutions, LLC<sup>104</sup>

Although Exelon transferred its license and sold its interests in the Zion facility to ZS, Exelon holds a position in ZionSolutions, LLC. Exelon is a Class B member, with no interest in the profits, losses, and capital of ZS, and no right to any distributions of ZS assets. Exelon has no voting rights as a member of ZS;<sup>105</sup> however, Exelon has the power to appoint the Exelon Director to the Board of Directors of ZS.<sup>106</sup> In that capacity, Exelon has the power to allow or prevent “material actions” by the ZS Board.<sup>107</sup> Those actions are defined in Schedule A of the LLC Agreement, which include any filing for Bankruptcy or other proceedings of insolvency. This power allows Exelon to block ZS from seeking relief in a bankruptcy proceeding, and, in conjunction with the parent guaranty from ES, Inc., force ES to perform under the guaranty.

#### Summary of Financial Assurances Imposed on ZS by Exelon

In summary, the financial assurances for the Zion facility decommissioning include:

- The NDT (\$788 million as of 12/31/2010)
- \$200 million LOC
- Unlimited parent company performance guarantee
- No-cost easement for disposal capacity
- 90 day time limit to cure a shortfall in financial assurance
- 120% excess financial assurance at start of decommissioning
- 200% excess financial assurance of remaining cost before reducing LOC
- Exelon is protected from any increases in cost due to government requirements

<sup>101</sup> Zion License Transfer Application, Exhibit F, Credit Support Agreement, January 25, 2008 (ML080310521)

<sup>102</sup> Transcript, Decommissioning Funding Workshop, Common Sessions, statement of Mr. Levin, March 2, 2011, p.191 (ML110810747)

<sup>103</sup> Safety Evaluation Report, Zion Nuclear Power Station Units 1 and 2, p.4, May 4, 2009 (ML090930063)

<sup>104</sup> Zion License Transfer Application, Limited Liability Agreement of ZionSolutions, LLC, January 25, 2008 (ML080310521)

<sup>105</sup> Id. Section 5

<sup>106</sup> Id. Section 10

<sup>107</sup> Id. Section 9 and Schedule A

- Exelon is a member of ZionSolutions, LLC
- Exelon has the right to appoint a Director to the ZS Board of Directors, with power, among other actions, to block ZS from instituting bankruptcy proceedings

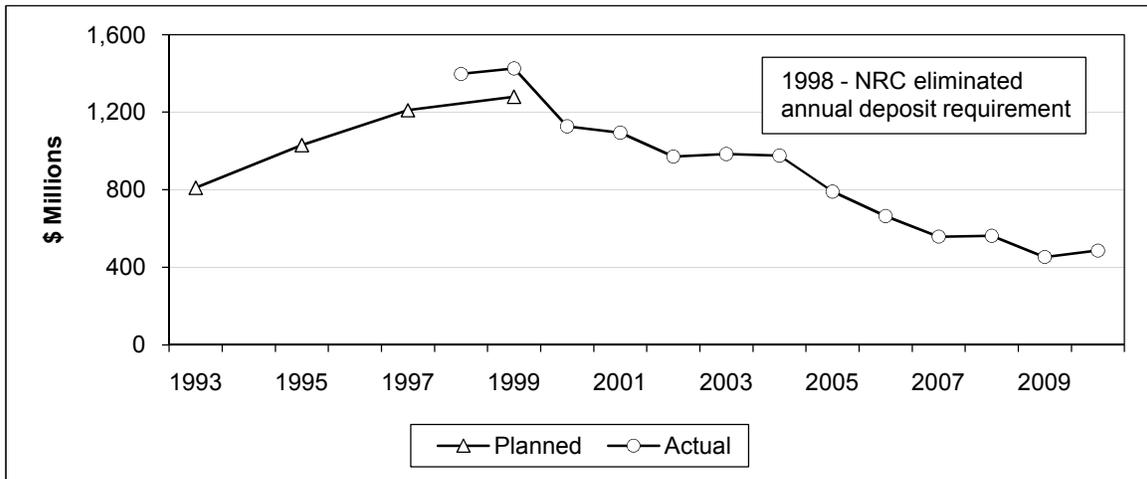
The 2010 transfer of the Zion facility from Exelon to ZionSolutions, Inc. (ZS) provides a comparison of NRC DFA requirements to a market-based resolution of the financial risks of non-performance of decommissioning by the licensee. It provides the first instance of a merchant plant that must depend on the NDT as the only source of funding. The agreements between Exelon and ZS contain many financial assurance mechanisms that exceed NRC requirements to address the financial risks of non-performance by the licensee. The risks mitigated by the agreements between Exelon and ZS are the same risks that concern stakeholders in local communities, States, and tribal governments.<sup>108</sup>

HISTORICAL DATA

Fund Contributions

The following chart shows the long-term downward trend in NDT contributions that began when the NRC eliminated the requirement to make annual deposits. The chart below shows planned contributions from 1993 to 1999 and actual contributions starting in 1998 and afterward. Planned contribution data is collected biennially by NISA Investment Advisors, based on a survey of Trust Sponsors that started in 1993.<sup>109</sup> Actual fund contribution data is collected by Duff & Phelps Investment Management Co. based on publicly available records.<sup>110</sup> Duff & Phelps began collecting data on actual contributions starting in 1998.<sup>111</sup>

**NDT Contributions by Year**



Before 1998, planned trust fund contributions had been rising, as shown in the chart titled, :NDT Contributions by Year.” The 1998 Decommissioning Rule, effective in November 1998,

<sup>108</sup> State of New York Office of the Attorney General, Issues Related to Decommissioning Funding, March 2, 2011 (ML110560594)

<sup>109</sup> NISA Investment Advisors, 2010 Survey of Trust Sponsors, *available at* <http://www.nisanet.com>

<sup>110</sup> Transcript, Decommissioning Funding Workshop, Breakout Session 2, statement of Mr. Krause (Duff & Phelps), p.43-47, March 2, 2011 (ML110750355)

<sup>111</sup> Duff & Phelps, Historical NDT Contributions, p.3, July 22, 2011 (ML11249A221)

eliminated the requirement for power reactor licensees to make contributions to their NDTs. The downward trend in contributions after the requirement was eliminated is apparent in the chart.

Analysis of the 2009 decommissioning fund status reports indicates that approximately 80% of the \$2.4 billion shortfall was reported by facilities that had delayed or ceased making payments into their NDTs.

### Rate of Return Compared to Decommissioning Cost Escalation

The regulations of 10 CFR 50.759e(1)(i) and (ii) allow up to a 2% real rate of return to place a value on the projected future earnings that may be credited for DFA purposes. If the licensee's rate regulatory authority permits, a higher real rate of return may be used. However, a negative real rate of return can result when the expected growth rate of the NDT lags the cost escalation rate for decommissioning. Examples are discussed below. Consequently, when requesting approval for a discounted PCG, the licensee needs to justify the real rate of return it selects.

A negative real rate of return can result when the growth rate of the NDT lags behind the cost escalation rate for decommissioning. For example, negative earnings credits were submitted for the NDT established for the Calvert Cliffs facility for approval in a ratemaking case.<sup>112</sup> In 2006, Baltimore Gas and Electric Company (BGE), a subsidiary of Constellation Energy Company, submitted a detailed assessment of its NDT investment performance and decommissioning cost escalation. The chart below illustrates the results of the assessment. Two independent experts evaluated the cost escalation rate for decommissioning. The experts estimated that the decommissioning cost escalation "premium" for Calvert Cliffs was about 2.6% per year greater than the rate of general inflation.<sup>113</sup> The NDT fund performance was based on actual returns from 1989 to 2005. BGE determined that the NDT real rate of return projection was negative, approximately -0.33% per year.<sup>114</sup> As a result, BGE required significant rate relief to accumulate adequate funds for decommissioning. The NRC formula amount for Calvert Cliffs Units 1 and 2 was \$644 million in 2005.<sup>115</sup> The future cost of decommissioning for the Calvert Cliffs facility was approximately \$5 billion at that time.

The chart titled, "2006 Submittal for Decommissioning Rate Relief for Calvert Cliffs Units 1 and 2," shows BGE's analysis. BGE concluded that it would need a rate increase from \$18.6 million to \$25 million per year until 2033 in order to accumulate the funds needed to decommission Calvert Cliffs.

Maryland Senate Bill 1013, which was signed into law on April 24, 2008, authorized continued collections by BGE of \$18.7 million annually in decommissioning charges for Calvert Cliffs through December 31, 2016. However, the Bill required BGE to provide credit for residential customers equal to the approximately \$18.7 million dollars collected annually for decommissioning and relieved ratepayers of all nuclear decommissioning liability for CCNPP, Inc., which is the NRC licensee for Calvert Cliffs Units 1 and 2.<sup>116</sup>

<sup>112</sup> Letter, BGE to Public Service Commission of Maryland, Re: Case No. 8794/8804 Compliance Filing, April 3, 2006, available at <http://webapp.psc.state.md.us>, Case No. 8804, Document No. 340 [Hereinafter BGE 2006 Letter]

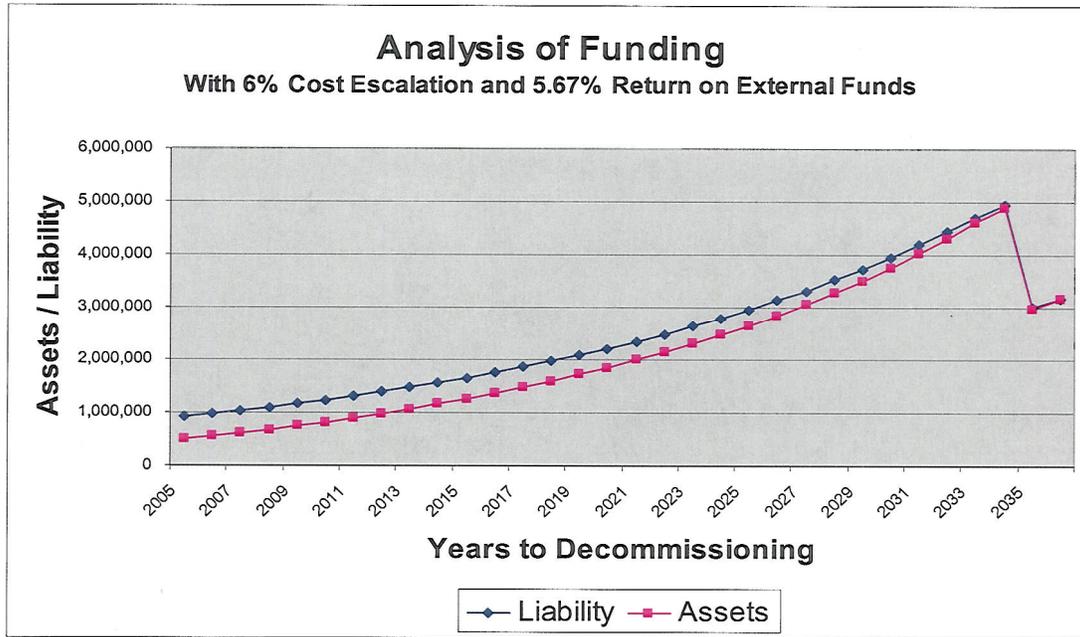
<sup>113</sup> Id. Attachment 6, Appendix A

<sup>114</sup> 5.67% return on external funds less 6% cost escalation = -0.33%

<sup>115</sup> Constellation Energy 2006 Biennial Fund Report, Attachment 1, p.1, February 8, 2006 (ML060450309)

<sup>116</sup> Revised Safety Evaluation by the Office of Nuclear Reactor Regulation: Direct and Indirect Transfers of Control of Renewed Facility Operating Licenses Due to the Proposed Corporate Restructuring Calvert Cliffs Nuclear Power

2006 Submittal for Decommissioning Rate Relief for Calvert Cliffs Units 1 and 2<sup>117</sup>



The negative growth rate illustrated by BGE is not untypical. ABZ, Inc. was one of the decommissioning cost experts that provided information for BGE’s 2006 submittal to the Public Service Commission of Maryland. ABZ, Inc. also participated in the recent March 2011 workshop and June 2011 follow-up meeting. They estimated that the industry-wide aggregate investment returns of NDT funds has not achieved a 2% real rate of growth when compared to the cost escalation in decommissioning as recorded in NUREG-1307, “Report on Waste Burial Charges.” ABZ, Inc. evaluated publicly available historical information on NDT fund growth after-tax growth rates.<sup>118</sup> They estimated the real rates of return based on decommissioning cost escalation rather than general inflation. The estimates are shown in the table below. The 2006 Calvert Cliffs rate case result falls roughly mid-range for all PWR decommissioning fund performance.

**Average After-Tax Annual Growth Rate of NDTs Compared to Decommissioning Cost Escalation Rate**

Period	2002 to 2010
Real growth (PWR)	-1.06 % to 0.76%
Real growth (BWR)	-1.07% to -0.45%

In view of the actual performance of NDTs compared to decommissioning cost escalation, if the discounting is allowed, the licensee would need to justify its assumptions regarding the real rate

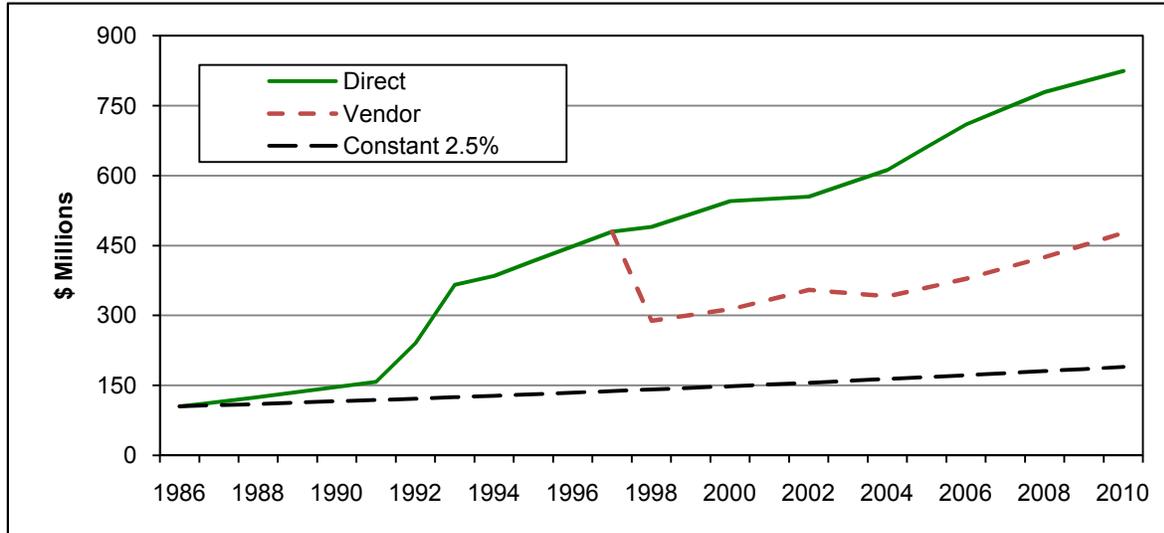
Plant, Unit Nos. 1 and 2; Calvert Cliffs Independent Spent Fuel Storage Installation, Nine Mile Point Nuclear Station, Unit Nos. 1 and 2; and R.E. Ginna Nuclear Power Plant, p.18, October 30, 2009 (ML093010003)

<sup>117</sup> BGE 2006 Letter, p.3

<sup>118</sup> ABZ, Inc., Current Decommissioning Issues, June 17, 2011 (ML111740054)

of return, under the specific circumstances of its submittal, rather than simply assume a 2% discount rate.

**NRC Formula Amounts by Year – Large PWR**



The chart labeled, “NRC Formula Amounts by Year – Large PWR,” compares historical decommissioning costs calculated by ABZ, Inc., based on data from NUREG-1307, with a typical cost escalation rate.<sup>119</sup> The “Direct” line is the amount calculated from the prescribed amount specified in § 50.75(c). The “Vendor” amount is an adjustment to the prescribed amount introduced in 1998. It recognizes the potential savings that may be available from using waste processing techniques provided by specialized vendors. The “Constant 2.5%” line is a typical cost escalation assumption observed by ABZ, Inc. in its review of decommissioning cost estimates made by licensees. The negative real rates of growth calculated by ABZ, Inc. in the table above titled, “Average After-Tax Annual Growth Rate of NDTs Compared to Decommissioning Cost Escalation Rate,” indicate that the rising costs of decommissioning have outpaced NDT fund growth over the last decade.

#### Effect of 2008 Market Downturn

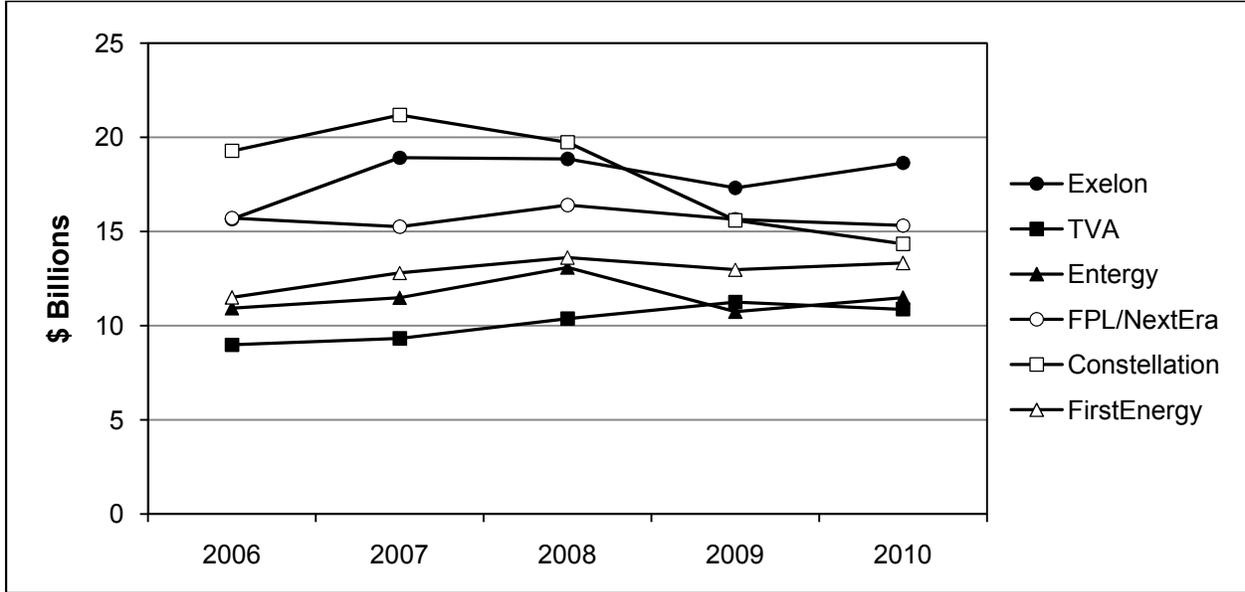
The financial performance of the six parent companies that owned reactor licensees that reported shortfalls in decommissioning financial assurance in March 2009 is shown in the following four charts. As seen in the charts, their financial performance did not change much during the recession of 2008 – 2009, with the exception of Constellation Energy Group. Constellation experienced large losses in its energy trading program in 2008, and sold a substantial interest in its nuclear business to Électricité de France in 2009.

Total Revenue is the consolidated value of all sales made by the parent company and its subsidiaries. Net Income is the residual income after adding revenues and gains and subtracting expenses and losses during the period. Total Common Shareholder’s Equity represents the stockholders’ claim to a business’ assets after all creditors and debts have been paid; it is also known as net worth. However, because the Tennessee Valley Authority is a government corporation without shareholders, the total proprietary capital recorded on the

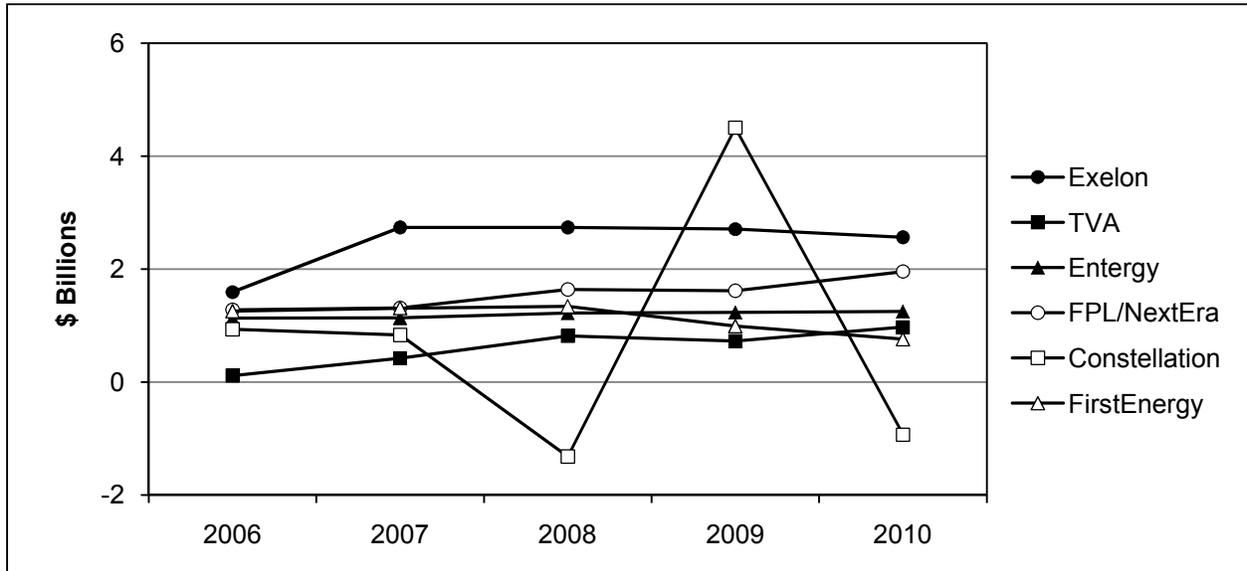
<sup>119</sup> ABZ, Inc., Cost Trends in Decommissioning, March 2, 2011 (ML110560598)

balance sheet is used in place of shareholder's equity. Net cash – Year End Balance is the amount of cash on hand held by the company at the end of its fiscal year.

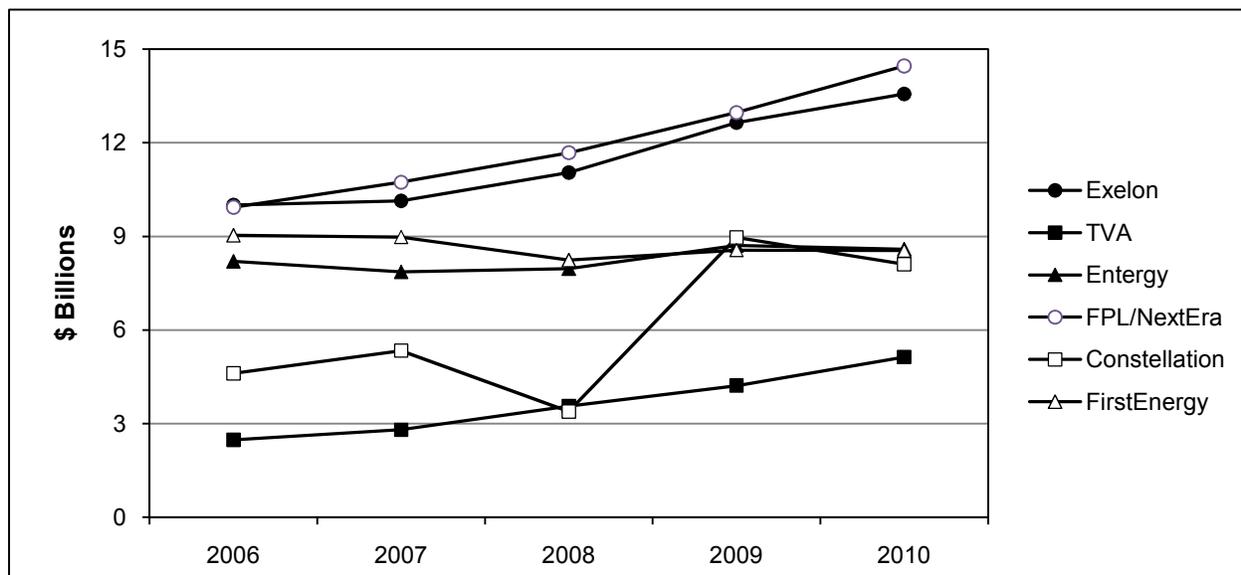
**Total Revenue by Year**



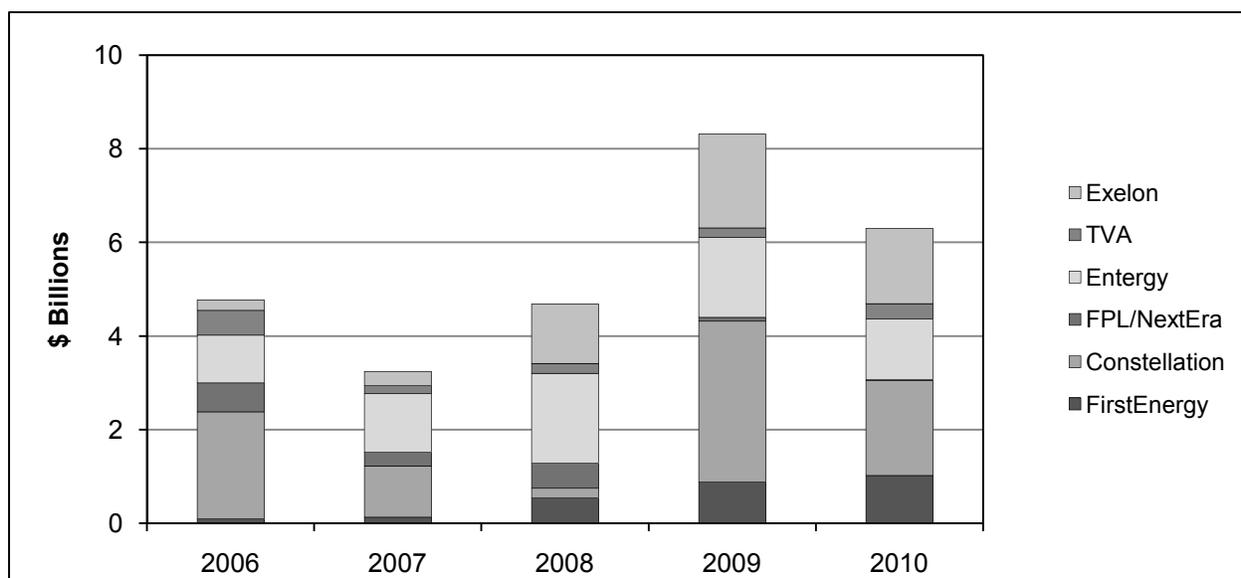
**Net Income by Year**



### Total Common Shareholder's Equity by Year



### Net Cash – Year End Balance



### PROBABILITY INSIGHTS

The March 2011 workshop provided insights regarding the probability of large shortfalls, given historical trends in investment performance, NDT fund contributions, and the rate of escalation in decommissioning costs.

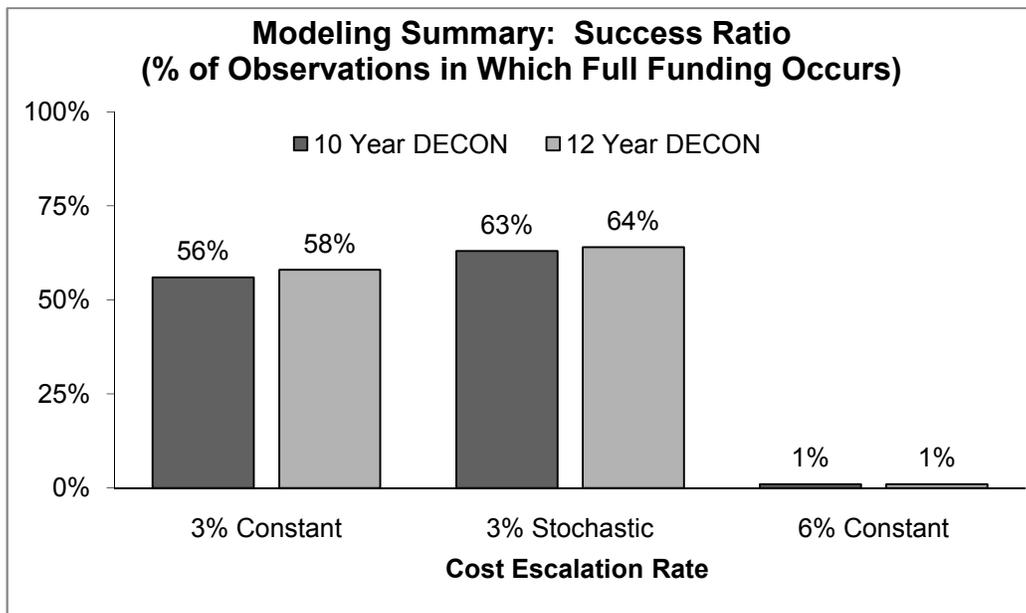
Dr. Daniel Williams presented information showing that the rate of return on investments and the rate of escalation in decommissioning costs are the two most important variables affecting the success of funding the cost of decommissioning. LCG Associates, Inc. presented a model

showing how cost escalation can affect the success of a NDT with a shortfall, while holding the investment strategy steady. GAO presented its study of how market volatility can reduce the ability of a trust fund to meet its funding target.

LCG Associates, an investment advisor for NDT funds, uses Monte Carlo methods to estimate the probability to success for its clients. The Monte Carlo model uses a distribution of investment returns to estimate the return on investment. The investment returns distribution is based on historical data. The model is run thousands of times to generate a probability distribution of possible outcomes. In contrast to the Monte Carlo technique, the NRC method computes a single outcome.

The chart titled, "Success Ratio of NDT with No Contributions," displays the results of LCG Associates' Monte Carlo analysis that a hypothetical NDT with a shortfall will achieve its goal of full funding of decommissioning.<sup>120</sup> The NDT is assumed to have \$345 million against a decommissioning cost of \$600 million. The plant has 22 years of life remaining. The plant will be decommissioned immediately after shutdown, and will take either 10 years or 12 years to complete the project. The 3% constant rate approximates the general inflation rate. The 3% stochastic rate considers the correlation between investment returns and general inflation. The 6% rate approximates the lower range of decommissioning cost escalation. The funds are assumed to be professionally managed and to experience historically observed growth rates and volatility. The model illustrates a significant probability of unfunded costs under the general inflation assumption, and a very significant probability of unfunded costs when actual decommissioning cost escalation is considered. No funds are added to the NDT in the model. The implication is that using the PCG to delay or cease making contributions to the NDT may significantly raise the probability that large unfunded decommissioning cost obligations will occur, because the PCG does not produce any actual cash return.

### Success Ratio of NDT with No Contributions



<sup>120</sup> LCG Associates, Nuclear Decommissioning Trust Asset/Liability Modeling, March 2, 2011 (ML110560778)

The chart provides some insight to the likelihood that investment returns will be sufficient, without making NDT contributions, where the NDT has a shortfall, to provide funds when needed for decommissioning. Under the Monte Carlo method, the probability of success varies from about 56% to 64%, when compared to a proxy for the general inflation rate (3% Constant, and 3% Stochastic). That implies about a 1 in 3 chance of not meeting the funding target. When compared to a proxy for the escalation rate of decommissioning costs (6% Constant), the probability of success declines to 1%. The chance of not meeting the funding target is about 99 in 100 in the higher cost escalation case.

LCG Associates also estimated the distribution of surpluses and shortfalls for the hypothetical fund for each scenario. The distribution results are shown in the table labeled, “Surplus or Shortfall of Funding in Monte Carlo and NRC Methods.” For comparison, results of the NRC evaluation method were applied to the hypothetical facts and included in the table. The “Median” column shows the funding level where half the results are above the value, and half below. The “2.5<sup>th</sup> Percentile” column shows the results at the lower end of the distribution; it can be thought of as the “worst case” result.

For comparison, the NRC evaluation method of LIC-205 was applied to the hypothetical facts used for the Monte Carlo model. The NRC’s evaluation of funding adequacy does not provide an estimate of the probability of success.<sup>121</sup> NRC considers a single scenario, based on the assumption of a constant 0% cost escalation rate, that is, no cost increases. The NRC allows up to a 2% real rate of return on investments, without any adjustments for market volatility. As seen in the table, using the NRC method shows the hypothetical NDT has shortfall.

#### **Surplus or Shortfall of Funding in Monte Carlo and NRC Methods**

Cost Escalation Rate	Monte Carlo Surplus or Shortfall ( - )		NRC Shortfall ( - )
	Median	2.5 <sup>th</sup> Percentile	Single Scenario
10 Year DECON			
0% Constant	n.a	n.a	-\$73 million
3% Constant	\$17 million	-\$118 million	n.a
3% Stochastic	\$31 million	-\$107 million	n.a
6% Constant	-\$310 million	-\$431 million	n.a
12 Year DECON			
0% Constant	n.a.	n.a.	-\$50 million
3% Constant	\$22 million	-\$120 million	n.a
3% Stochastic	\$36 million	-\$108 million	n.a
6% Constant	-\$327 million	-\$450 million	n.a

In this example, the NRC result falls below the median when the cost escalation rate is moderate. When the rate of cost escalation is higher, the NRC result falls above the median and significantly underestimates the shortfall.

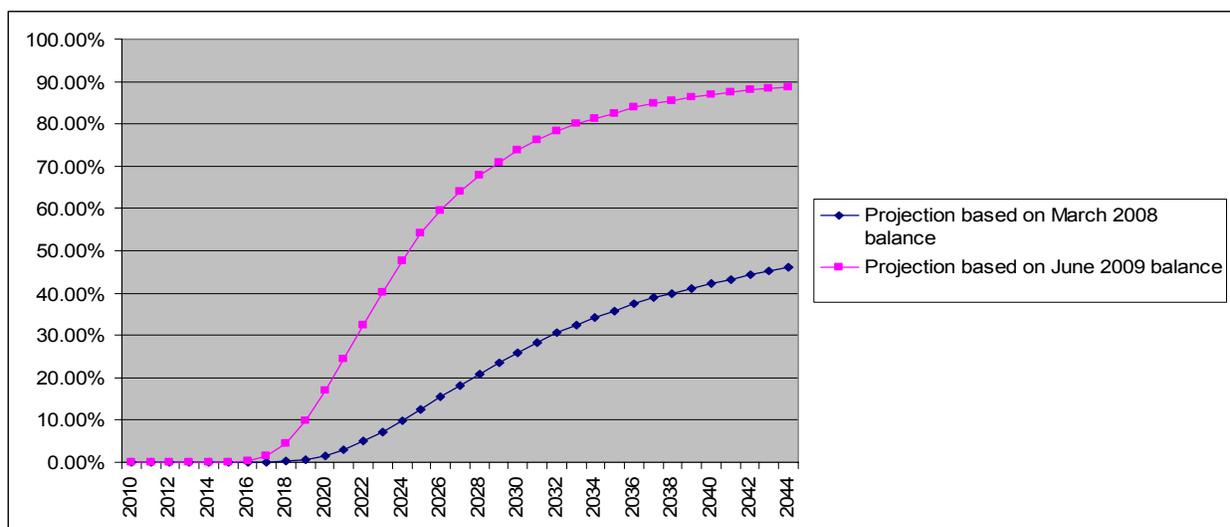
<sup>121</sup> SECY-10-0084, Enclosure 2, “Response to Comments on Draft Guidance DG-1229, ‘Assuring the Availability of Funds for Decommissioning Nuclear Reactors,’” discusses the NRC evaluation method for funding assurance at p.6 - 4 and p.36 – 41. (ML101540488)

Some insight into the effect of a longer time horizon can be seen in the table. The deterministic model used by NRC is expected to show lower shortfalls for longer time horizons, due to its implicit assumption that investment return will outpace cost escalation. That result is seen in the table. The Monte Carlo method shows the opposite result. In cases where shortfalls occur, adding time to the investment horizon actually increases the size of the shortfall.

The enclosed table on Nuclear Decommissioning Cost Estimates and Cost Escalation Rates shows that decommissioning costs have risen between 4.7% and 9.0% per annum since 1986. Considering the cost escalation rates in the table suggests that the Monte Carlo model results for the 6% constant cost escalation rate may be more representative of future cost trends. That conclusion suggests that the size of shortfalls, for cases where the licensee delays or ceases making contributions to its NDT, are likely to be higher than estimated with the NRC method.

The GAO’s presentation illustrated that longer time horizons can increase the risk of shortfalls when no funds are added to the NDT.<sup>122</sup> GAO performed a Monte Carlo analysis of a trust fund set up by the United States Government to provide economic assistance to the Republic of Palau. The results are shown in the chart labeled, “Probability of Shortfall in Trust Fund Given Market Volatility.” A deterministic calculation showed that the trust fund would meet its goals even if its investment returns lagged slightly behind its historical average. However, when the effect of market volatility was factored into the evaluation, a significant risk was observed in the ability of the trust fund to meet its goals. Also significant is the observation that the risk of shortfalls increased with time. The implication for reactor DFA is that using SAFSTOR to project larger earnings credits under the NRC’s deterministic rules may mask an increased the risk of shortfalls due to market volatility. The results of the analysis are shown in the chart below. If withdrawals are necessary at a time when the investments have lost value, the depleted balance may be unable to catch up. That is relevant to SAFSTOR evaluations, since paying the costs to maintain safe storage cannot be delayed, and may require NDT withdrawals to maintain safety.

**Probability of Shortfall in Trust Fund Given Market Volatility**



<sup>122</sup> GAO, Analyzing Uncertainty Using Monte Carlo Simulation, March 2, 2011 (ML11060025)

While market volatility produces risks to decommissioning funding success on its own, the effects can be compounded when the cost escalation is also high. Recall the ABZ Inc. estimates above, showing that the real rate of return has been negative in many cases. The cost escalation rate of decommissioning, as measured by NUREG-1307, ranges from 6% to 9% per year. The volatility risk and cost escalation risk synergistically raise the risk that shortfalls will occur if no contributions are made to the NDT.

In summary, the probability insights provided by the models suggest the following factors that should be considered when evaluating a discounted PCG:

- Real rate of return
- Cost escalation
- Market Volatility
- Delay or cessation of NDT contributions

**NUCLEAR DECOMMISSIONING COST ESTIMATES AND COST ESCALATION RATES  
as of December 2010**

<b>Labor Region</b>	<b>Reactor</b>	<b>Compact</b>	<b>Burial Contract</b>	<b>Cost (\$MM)</b>	<b>Compound Growth (%)</b>	<b>% Change '09-'10 (%)</b>
Northeast	PWR	Atlantic	Direct	828.5	9.0	7.1
Northeast	PWR	Atlantic	Waste Vendor	481.8	6.6	15.1
Northeast	PWR	Non-Atlantic	Direct	828.5	9.0	7.1
Northeast	PWR	Non-Atlantic	Waste Vendor	481.8	6.6	15.1
Northeast	BWR	Atlantic	Direct	979.1	8.6	7.1
Northeast	BWR	Atlantic	Waste Vendor	628.1	6.6	8.7
Northeast	BWR	Non-Atlantic	Direct	979.1	8.6	7.1
Northeast	BWR	Non-Atlantic	Waste Vendor	628.1	6.6	8.7
South	PWR	Atlantic	Direct	813.5	8.9	7.2
South	PWR	Atlantic	Waste Vendor	466.8	6.4	15.5
South	PWR	Non-Atlantic	Direct	813.5	8.9	7.2
South	PWR	Non-Atlantic	Waste Vendor	466.8	6.4	15.5
South	BWR	Atlantic	Direct	959.8	8.5	7.2
South	BWR	Atlantic	Waste Vendor	608.8	6.5	8.8
South	BWR	Non-Atlantic	Direct	959.8	8.5	7.2
South	BWR	Non-Atlantic	Waste Vendor	608.8	6.5	8.8
Midwest	PWR	Non-Atlantic	Direct	819.7	8.9	7.3
Midwest	PWR	Non-Atlantic	Waste Vendor	472.9	6.5	15.6
Midwest	BWR	Non-Atlantic	Direct	967.7	8.6	7.3
Midwest	BWR	Non-Atlantic	Waste Vendor	616.7	6.5	9.0
West	PWR	Non-Atlantic	Direct	819.7	8.9	7.1
West	PWR	Non-Atlantic	Waste Vendor	472.9	6.5	15.2
West	PWR	Northwest	Direct	374.8	5.4	0.3
West	PWR	Northwest	Waste Vendor	341.4	5.0	13.3
West	BWR	Non-Atlantic	Direct	967.7	8.6	7.1
West	BWR	Non-Atlantic	Waste Vendor	616.7	6.5	8.7
West	BWR	Northwest	Direct	464.7	5.3	-49.7
West	BWR	Northwest	Waste Vendor	406.4	4.7	-52.5

Source: Historical NDT Fund Balances, Annual Contributions and Decommissioning Cost Estimates, Duff & Phelps Investment Management Company, March 2, 2011 (ML110690037)

Notes:

1. Cost calculated by Duff & Phelps, based on data from NUREG-1307, Vol. 14, "Report on Waste Burial Charges"
2. Compound Growth = Annualized % change over 24 years from 1986 Base Cost, calculated by Duff & Phelps

RESPONSE TO COMMENTS

OPTIONS TO EVALUATE REQUESTS TO USE DISCOUNTED PARENT COMPANY  
GUARANTEES TO ASSURE FUNDING OF DECOMMISSIONING COSTS  
FOR POWER REACTORS

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## Comments on Regulations

### *Comment 1: Regulations are silent regarding an earnings credit for the PCG*

The Nuclear Energy Institute (NEI) stated that the regulations are silent regarding the addition of an earnings credit to a discounted parent company guarantee (PCG), therefore, it is permitted. Its argument is based on the fact that the prepayment and external sinking fund methods, defined in §§ 50.75(e)(1)(i) and (ii), allow the licensee to take an earnings credit for funds in the NDT, while the guarantee language is silent with respect to earnings credits. NEI maintains that the silence, coupled with the allowance for earnings credits for the prepayment and external sinking fund, proves that the licensee may add an earnings credit to a discounted PCG.

#### *Response:*

NEI's conclusion is incorrect because the NRC requires every combination of methods and non-standard method, such as a discounted PCG, to be evaluated on a case-by-case basis under § 50.75(e)(1)(vi), and regulatory silence does not necessarily grant permission to perform an action not expressly forbidden. Additionally, when earnings credit language is included in one portion of the regulations but not in another, adoption of the earnings credit is precluded in the other portions. Finally, the language of 10 C.F.R. §50.75(e)(1)(i) and (ii) suggests that PCGs would not satisfy the requirements for earnings credits. Therefore, NEI's claim that silence equals permission is incorrect.

The following discussion describes NEI's proposal, the requirement for case-by-case evaluation of combinations of decommissioning financial assurance (DFA) methods and non-standard DFA methods, the proper interpretation of regulatory silence and omission, and the ineligibility of the parent company's funds to qualify for an earnings credit.

Net present value (NPV) is a tool for appraising the value of long-term projects by discounting estimated future cash inflows and outflows backward in time, which reduces them to today's dollars. The cash flows can be compared to determine if the project will be profitable, assuming the estimates are accurate. NEI proposed to discount the cost of decommissioning, using NPV to determine the size of the discount, and to guarantee the discounted amount using the PCG, in whole or part. A PCG valued in this manner is termed a "discounted PCG." NEI stated that a discounted PCG should be acceptable because earnings credits are permitted for actual funds held in a nuclear decommissioning trust (NDT). With respect to NEI's proposal, the NPV approach may refer to either adding an earnings credit to the PCG or discounting the PCG.

#### I. Case-by-Case Evaluation

The Commission stated its intent regarding the provisions of § 50.75(e)(1)(vi):

In promulgating subsection (vi), we intended to give applicants the flexibility necessary to structure methods outside the parameters of any one of the five methods set forth in subsections (i) through (v), or to combine portions of those subsections in such a way as to provide the same end-result of funding assurance.<sup>1</sup>

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<sup>1</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating Unit No. 3), CLI-00-14, 53 NRC 488, 550-551 (2001) [Hereinafter PASNY transfer case]

The Commission explained that the flexibility signaled the intent to “consider, on a case-by-case basis, funding mechanisms not expressly permitted under subsections (i) through (v).”<sup>2</sup> This does not, however, allow the licensee to create and take credit for any mechanism not expressly permitted by the regulations without approval by the NRC.

NEI acknowledges that the methods it proposes, namely the discounted PCG and the NPV method, are not expressly permitted.<sup>3</sup> However, the licensee may request the NRC to consider those methods under the provisions of § 50.75(e)(1)(vi). NEI asserts that the discounted PCG and NPV method are permitted by § 50.75(e)(1)(vi) without requiring NRC approval. As discussed in the response to Comment 5, that assertion is incorrect.

The correct approach, as provided under 10 CFR § 50.75(e)(1)(vi), requires the licensee to request that the NRC consider those methods.<sup>4</sup> If the licensee can demonstrate that the specific circumstances of its submittal provides assurance of decommissioning funding equivalent to that provided by the mechanisms of § 50.75(e)(1)(i) through (v), then the NRC may approve its use.<sup>5</sup> Furthermore, as discussed in the Additional Information section titled, “Transfer Orders Applying the Equivalency Test of § 50.75(e)(1),” the NRC may impose conditions to achieve the requisite equivalent assurance. However, without NRC approval, the licensee is not free to use a method not expressly permitted under 10 CFR § 50.75(e)(1). Applying an earnings credits to the PCG, or discounting the PCG, are not included in 10 CFR § 50.75(e)(1), and cannot be used without prior approval from the NRC.

## II. Interpretation of regulatory silence

The Federal Courts have established a number of possible interpretations of statutory silence (i.e. when a statute or regulation does not expressly deal with the immediate issue), which include the following:<sup>6</sup>

- Silence intends to rule out a particular statutory application<sup>7</sup>
- Silence signifies the expectation that nothing more need be said to accomplish the statutory objective<sup>8</sup>
- Silence signifies the issue has not been considered at all<sup>9</sup>
- It is a “pregnant silence” that contrasts with a consistent pattern under which departures from a general rule had been expressly authorized<sup>10</sup>
- No inference drawn from statutory silence can be credited when it is contrary to all other textual and contextual evidence of intent.<sup>11</sup>

Regarding DFA, the Commission stated: “A licensee is required to provide assurance that at any time during the life of the facility, through termination of the license, adequate funds will be

<sup>2</sup> *Id.*

<sup>3</sup> NEI, Industry Comments on June 8 Workshop, p.3, July 13, 2011 (ML11196A203), “This provision [10 CFR 50.75(e)(1)(iii)] does not address the method of determining the amount of the guarantee.”

<sup>4</sup> 10 C.F.R. § 50.75(e)(1)(vi).

<sup>5</sup> *Id.*

<sup>6</sup> Congressional Research Service, Statutory Interpretation: General Principles and Recent Trends, p.16 – 17, Order Code 97-598, August 31, 2008

<sup>7</sup> *Burns v. United States*, 501 U.S. 129, 136 (1991)

<sup>8</sup> *Id.*

<sup>9</sup> See *Tobias Holdings, Inc. v. Bank United Corp.*, 177 F. Supp. 2d 162, 167 (S.D.N.Y. 2001); *Dunn-McCampbell Royalty Interest, Inc. v. Nat’l Park Serv.*, V-06-59, 2008 U.S. Dist. Lexis 79101, at \*44 (S.D. Tex. Sept 30, 2008) (referencing *Burns*, 501 U.S. at 136).

<sup>10</sup> *Burns*, 501 U.S. at 136.

<sup>11</sup> *Andrus v. Glover Const. Co.*, 446 U.S. 608, 616-17 (1980)

available to complete decommissioning.”<sup>12</sup> Commission regulations, at 10 CFR 50.75, further state:

§ 50.75 (b)(1) For an applicant for or holder of an operating license under part 50, the [decommissioning] report must contain a certification that financial assurance for decommissioning will be (for a license applicant), or has been (for a license holder), provided in an amount which may be more, but not less, than the amount stated in the table in paragraph (c)(1) of this section adjusted using a rate at least equal to that stated in paragraph (c)(2) of this section.

...

(2) The amount to be provided must be adjusted annually using a rate at least equal to that stated in paragraph (c)(2) of this section.

(3) The amount must be covered by one or more of the methods described in paragraph (e) of this section as acceptable to the NRC.

Based on the intent of the Commission, as established by the above regulations, NEI's argument is incorrect. A licensee is prohibited from adding an earnings credit to a PCG, or discounting the amount the PCG will cover. The reasons for this conclusion are discussed in the following sections.

#### A. Intention to Rule Out a Particular Statutory Application

The Supreme Court has established that in certain circumstances silence intends to rule out a particular statutory application.<sup>13</sup> 10 CFR § 50.75(e)(1) allows for earnings credits when using the prepayment and external sinking fund methods to establish the DFA.<sup>14</sup> However, the regulations do not provide such an option for PCGs.<sup>15</sup> While the regulations do not expressly forbid earnings credits for PCGs, the evidence suggests that such an intent was implied in the regulations. The earnings credit and PCG amendments to the regulations were issued together in the 1998 Decommissioning Rule.<sup>16</sup> The establishment of prepayment, external sinking funds, and PCGs are in the same Part and section in the regulations.<sup>17</sup> The discussion for each section lies on consecutive pages.<sup>18</sup> The proximity of the sections implies that when the NRC staff implemented the rule changes that authorized earnings discounts for two of the six methods of establishing DFA, it intended to apply it to those two alone and none other. Additionally, during the June 8, 2011 follow-up meeting, NRC staff members who assisted with the 1998 Decommissioning Rule stated that there was no intent to allow earnings credits for the PCG when earnings credits were added to the prepayment and external sinking fund provisions of 10 C.F.R. §§ 50.75(e)(1)(i) and (ii).<sup>19</sup> Since the intent was to apply the earnings discount to prepayment and external sinking funds alone, the silence with regard to earnings discounts for all other methods is meant to rule out application of the earnings discount for any other method. Therefore, the Commission's silence rules out the application of an earnings credit or discount for the PCG.

<sup>12</sup> Decommissioning of Nuclear Power Reactors, Final Rule, July 29, 1996, 61 FR 39278

<sup>13</sup> *Burns*, 501 U.S. at 136

<sup>14</sup> 10 C.F.R. § 50.75(e)(1)(i) and (ii).

<sup>15</sup> See 10 C.F.R. §50.75(e)(1)(iii)(B).

<sup>16</sup> 1998 Decommissioning Rule, 63 FR 50465, 50481

<sup>17</sup> *Id.* § 50.75(e).

<sup>18</sup> *Id.*

<sup>19</sup> Transcript, June 8, 2011 Follow-up Meeting, statement of Ms. Uttal, p.32 (ML111650033)

### B. Expectation that Nothing More Need be Said

The Court also established that legislative silence could signify the expectation that nothing more need be said to accomplish the statutory objective.<sup>20</sup> As stated above, the regulations authorize the earnings discount for two of the six methods for establishing DFA.<sup>21</sup> The earnings credit and PCG amendments to the regulations were issued together in the 1998 Decommissioning Rule.<sup>22</sup> The Commission's intent of providing an earnings credit for the prepayment and external sinking fund methods is clearly met by the existing language in the regulations.<sup>23</sup> There is no need to alter the language to insert express prohibitions in the other four methods in order to meet that Commission intent. Therefore, the Commission's silence as to that prohibition could easily be taken as an expectation that nothing more need be said to accomplish its intent. Therefore, the silence of the rule does not support allowing an earnings credit to or a discount for the PCG.

### C. Issue has Not Been Considered

Certain federal courts have found that silence can also signify that the issue has not been considered by Congress or the Commission.<sup>24</sup> This interpretation is not applicable here because it can be implied that the Commission did consider the issue. The Commission explicitly allowed the earnings credit to be applied for the prepayment and external sinking fund methods of 10 C.F.R. §§ 50.75(e)(1)(i) and (ii).<sup>25</sup> The earnings credit and PCG amendments to the regulations were issued together in the 1998 Decommissioning Rule.<sup>26</sup> Since it considered and applied the earnings credit in those two situations, but not for the other four methods of establish DFA, it is likely that the Commission considered the credit in PCG situations and chose not to apply it. Therefore, this interpretation does not support NEI's conclusion.

### D. Departures from a General Rule Have Been Expressly Authorized

The Supreme Court has recognized that at times legislative silence is "a pregnant silence that contrasts with a consistent pattern under which departures from a general rule had been expressly authorized."<sup>27</sup> In applying this interpretation, the general rule must be determined. The PCG rule is established in 10 C.F.R. Appendix A to Part 30 (Appendix A). In every instance where the regulations authorize PCG use for DFA, that section refers to Appendix A as its authoritative basis.<sup>28</sup> Therefore, Appendix A is the general rule for PCGs.

To establish that the silence of earnings credits in Appendix A to Part 30 is "pregnant," and thus shows intent to allow earnings credits for the PCG, it must be shown that earnings credits were added to the PCG in a consistent pattern that was expressly authorized. That showing has not been made.

<sup>20</sup> *Burns*, 501 U.S. at 136.

<sup>21</sup> 10 C.F.R. § 50.75(e)(1)(i) and (ii).

<sup>22</sup> 1998 Decommissioning Rule, 63 FR 50465, 50481

<sup>23</sup> *See id.*

<sup>24</sup> *See Tobias Holdings, Inc.*, 177 F. Supp. 2d at 167; *Dunn-McCampbell Royalty Interest, Inc.*, 2008 U.S. Dist. Lexis 79101 at \*44.

<sup>25</sup> 10 C.F.R. § 50.75(e)(1)(i) and (ii).

<sup>26</sup> 1998 Decommissioning Rule, 63 FR 50465, 50481

<sup>27</sup> *Andrus*, 446 U.S. at 616-17.

<sup>28</sup> *Compare* § 30.35, § 40.36, § 50.75, § 70.25, § 72.30

First, a consistent pattern has not been established. Since 1988, PCGs and self-guarantees have been approved for dozens of reactor and materials licensees.<sup>29</sup> When annual requalification is considered, over 200 guarantees have been approved without allowing an earnings credit or a discount. For example, self-guarantees covering four research and test reactors (RTRs) have been approved each year since 1993. In every instance, the guarantee did not discounting. For power reactors, non-discounted PCGs were approved in 2003, 2009, 2010, and 2011. NEI, however, referred to three license transfer orders, approved in 2001 and 2005, as examples of approval for adding an earnings credit to the PCG.<sup>30</sup> The three license transfer orders do not establish a consistent pattern because hundreds of PCGs were approved without an earnings credit or a discount for the PCG before, during, and after the time period when the three license transfer orders were approved. Even within the three license transfer orders themselves, the pattern is not consistent. As discussed in the response to Comment 2, one of the three license transfer orders approved a PCG that covered the shortfall in DFA, while the other two orders approved PCGs that did not cover the shortfall.

Second, there has been no showing that, with regard to the PCG, that the three license transfer orders were expressly authorized. As shown in Comments 2 and 3 following, the license transfer order approvals were issued in error with respect to DFA, and are not precedential.<sup>31</sup> However, even if the orders had been decided correctly, they would not be precedents, nor establish a pattern. The Commission stated that DFA decisions in license transfer orders have limited value as precedents, especially for non-standard methods of providing DFA:

We see no risk here of a dangerous precedent. In the area of decommissioning funding assurance, each transfer application is examined *on its own facts*. This will be especially true of applications seeking to use an assurance other than those specifically described in sections 50.75(e)(1)(i)-(v). ... Because of the fact-driven nature of our decommissioning rulings in this proceeding, their precedential value is, as a practical matter, limited to an indication of the Commission's openness to funding arrangements not specifically enumerated in subsections (i)-(v).<sup>32</sup> [Emphasis in original]

The two conditions needed to justify the silence of the regulations as “pregnant” are not satisfied. Therefore, the silence of the rule does not support allowing an earnings credit for the PCG.

#### E. No Inference When Contrary to All Other Evidence of Intent

The Court has also established that “[n]o inference drawn from statutory silence can be credited when it is contrary to all other textual and contextual evidence of intent.”<sup>33</sup> The NRC amended

<sup>29</sup> Financial Assurance Inventory Log, Office of Federal and State Materials and Environmental Management Program; Decommissioning fund status reports, Office of Nuclear Reactor Regulation

<sup>30</sup> Millstone Nuclear Power Station, Unit Nos. 1, 2, and 3 – Order Approving the Transfer of Licenses from Northeast Nuclear Energy Company, et al., to Dominion Nuclear Connecticut, Inc., and Approving Conforming Amendments, March 9, 2001 (ML010160314); Nine Mile Point Nuclear Station, Unit Nos. 1 and 2 – Order Approving the Direct Transfer of Licenses from Niagara Mohawk Power Corporation, et al., to Nine Mile Point Nuclear Station, LLC, Approving Conforming Amendments, and Approving Indirect Transfers, June 24, 2001 (ML011520030); Corrected Order Approving Transfer of Licenses and Corrected Conforming Amendments Relating to Beaver Valley Power Station, Units 1 and 2, Davis-Besse Nuclear Power Station, Unit 1, and Perry Nuclear Power Plant, Unit 1, December 16, 2005 (ML053460182)

<sup>31</sup> See *infra* Comments 2 and 3.

<sup>32</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating, Unit No. 3), CLI-00-14, 53 NRC 488, 556-557 (2001)

<sup>33</sup> *Andrus*, 446 U.S. at 616-17.

its rules for PCGs and the closely related self-guarantee in 5 rulemakings.<sup>34</sup> Those rulemakings did not result in regulations that expressly authorized discounts for the PCG, added an earnings credit to the PCG, or applied the net present value approach to determining the amount of the PCG.<sup>35</sup> As mentioned above, during the June 8, 2011 follow-up meeting, staff members who assisted with the 1998 Decommissioning Rule stated there was no intent to allow earnings credits for the PCG when earnings credits were added to prepayment and external sinking fund provisions of 10 C.F.R. §§ 50.75(e)(1)(i) and (ii).<sup>36</sup> Therefore, there can be no inference allowing earnings discounts for PCGs when it is clearly contrary to the other existing evidence.

Since no interpretation of Commission silence as established by the Courts authorizes an earnings credit or discounts for PCGs, and such a discount is contrary to the Commission's intent, NEI's claim that earnings credits or discounts apply to PCGs is therefore incorrect.

### III. Interpretation of omission

NEI's claim that earnings credits apply to PCGs runs contrary to the Supreme Court's principle on interpretation of an omission within a statute or regulation. The Court stated that "where Congress includes particular language in one section of a statute but omits it in another ..., it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion."<sup>37</sup> The Court additionally stated that "negative implications raised by disparate provisions are strongest when the portions of a statute treated differently had already been joined together and were being considered simultaneously when the language raising the implication was inserted."<sup>38</sup>

The earnings credit for the prepayment and the external sinking fund methods was added in 1998; at the same time the PCG rule was amended to allow reactor licensees to combine the PCG with other methods.<sup>39</sup> No earnings credit, however, was added to the PCG rule.<sup>40</sup> In applying the rule established by the Court, the presumption is that the NRC intentionally excluded the earnings credit from the PCG in order to prevent its use in that manner. In addition, because the adoption of the earnings credit was considered simultaneously with the exclusion from the PCG, the negative implications of the disparate provisions are at their strongest. Therefore, NEI's claim that the omission allows the application of earnings credit to PCGs is incorrect.

### IV. Affiliated company funds not eligible

Even if the earnings credit was applicable to the other methods of establishing DFA, the language of 10 C.F.R. 50.75(e)(1)(i) and (ii) indicates that PCGs would not meet the requirements for earnings credits. The regulations for both the prepayment and external sinking fund methods are similar in that the funds are deposited "into an account segregated from licensee assets and outside the administrative control of the licensee and its subsidiaries or

<sup>34</sup> General Requirements for Decommissioning Nuclear Facilities, Final Rule, July 27, 1988, 53 FR 24018; Self-Guarantee as an Additional Financial Assurance Mechanism, Final Rule, December 29, 1993, 58 FR 68726; Financial Assurance Requirements for Decommissioning Nuclear Power Reactors, Final Rule, September 22, 1998, 63 FR 50465 [Hereinafter the 1998 Decommissioning Rule]; Decommissioning Trust Provisions, Final Rule, December 24, 2002, 67 FR 78332; Decommissioning Planning, Final Rule, June 17, 2011, 76 FR 35512.

<sup>35</sup> *See id.*

<sup>36</sup> Transcript, June 8, 2011 Follow-up Meeting, statement of Ms. Uttal, p.32 (ML111650033)

<sup>37</sup> *Keene Corp. v. United States*, 508 U.S. 200, 208 (1993)

<sup>38</sup> *Lindh v. Murphy*, 521 U.S. 320, 330 (1997)

<sup>39</sup> 1998 Decommissioning Rule, 63 FR 50465

<sup>40</sup> *See id.*

affiliates of cash or liquid assets.”<sup>41</sup> The earnings credit is calculated based on the funds in this account. But the PCG is not a segregated account and has no funds, so it cannot take an earnings credit.

Additionally, the parent company providing the guarantee is an affiliate of the licensee.<sup>42</sup> Even if the parent maintained a fund to cover the PCG, it would not meet the requirements to take an earnings credit because it would be within the control of an affiliated company. Therefore, the limitations placed on the account holding the funds also indicate that allowing an earnings credit for the PCG would not be possible under the regulations.

## V. Summary

NEI’s claim that discounting or earnings credits should be allowed for PCGs is incorrect because, under 10 CFR § 50.75(1)(e)(vi), any combination of methods or non-standard method must be evaluated by the NRC on a case-by-case basis, and no such evaluation has occurred. The regulations are silent on the issue of discounting and earnings credits for PCGs, and no interpretation of that silence, as established by the Courts, supports NEI’s claim. Additionally, the Supreme Court’s rule on omissions when similar language is included in one portion of a statute or regulation, but not in another precludes the adoption of discounting or earnings credits for PCGs. Finally, the language used in the two methods (prepayment and the external sinking fund) where earnings credits are allowed suggest that PCGs would not satisfy the requirements for earnings credits. Therefore, NEI’s claim is incorrect.

In view of the above, the PCG guarantees only its face amount. Neither an earnings credit nor a discount may be applied to the PCG without approval from the NRC.

*Comment 2: Three license transfer orders approved the use of discounted PCGs.*

NEI stated that certain license transfer orders approved discounted PCGs, and that the NRC is bound to follow those orders as a precedent.

### *Response*

The three orders were: the Millstone facility<sup>43</sup> (Millstone), the Nine Mile Point facility<sup>44</sup> (NMP) and the Beaver Valley and Perry facilities (FENOC) (collectively, “the three license transfer orders”).<sup>45</sup> Each transfer application proposed a combination of a NDT in a prepaid account, a discounted PCG, and a license condition to adjust the PCG each year to provide DFA. However, the financial assurance provisions in the orders were erroneously approved. The approvals did not apply the equivalence test required by § 50.75(e)(i)(vi) to evaluate the

<sup>41</sup> 10 C.F.R. §§ 50.75(e)(1)(i), (ii).

<sup>42</sup> The US Federal Energy Regulatory Commission (FERC) defines affiliate as: “Any person that directly or indirectly owns, controls, or holds with power to vote, 10 percent or more of the outstanding voting securities of the specified company.” 18 CFR § 35.36(a)(9).

<sup>43</sup> Millstone Nuclear Power Station, Unit Nos. 1, 2, and 3 – Order Approving the Transfer of Licenses from Northeast Nuclear Energy Company, et al., to Dominion Nuclear Connecticut, Inc., and Approving Conforming Amendments, March 9, 2001 (ML010160314) [Hereinafter Millstone 2001 Order]

<sup>44</sup> Nine Mile Point Nuclear Station, Unit Nos. 1 and 2 – Order Approving the Direct Transfer of Licenses from Niagara Mohawk Power Corporation, et al., to Nine Mile Point Nuclear Station, LLC, Approving Conforming Amendments, and Approving Indirect Transfers, June 24, 2001 (ML011520030) [Hereinafter NMP 2001 Order]

<sup>45</sup> Corrected Order Approving Transfer of Licenses and Corrected Conforming Amendments Relating to Beaver Valley Power Station, Units 1 and 2, Davis-Besse Nuclear Power Station, Unit 1, and Perry Nuclear Power Plant, Unit 1, December 16, 2005 (ML053460182) [Hereinafter FENOC 2005 Order]

combinations of DFA methods proposed by the licensees. Approval was apparently based on allowing an earnings credit for the PCG, based on examination of worksheets submitted in the applications. However, in two of the orders, the amount provided by the PCG did not cover the shortfall, and did not meet the minimum requirement of § 50.75(c). The orders are not precedents and the NRC is not bound to repeat the errors.

In its consideration of the comment, the NRC staff re-evaluated the DFA proposed by the licensees. Enclosure 6 shows the results of the re-evaluation of the Millstone 2001 Order. Enclosure 6 contains three worksheets: (1) the Millstone licensee's worksheet submitted in its transfer application;<sup>46</sup> (2) the NRC's re-evaluation using the method of Office Instruction LIC-205, "Procedures for NRC's Independent Analysis of Decommissioning Funding Assurance for Operating Nuclear Power Reactors;" and (3) an NRC evaluation of the shortfall in nominal dollars. The Millstone worksheet shows three figures that are added together to determine the "Trust Fund Balances at Closing" value of \$293 million. The total includes \$25 million in the form of a PCG. The Millstone worksheet then computes the earnings on a trust fund balance of \$293 million, and subtracts the expenses on a year-by-year basis. The result shows that starting with a NDT balance of \$293 million will produce earnings that will cover the expenses. However, the actual starting value of the trust fund at closing was only \$268 million, as explained in the licensee's application. As a result, the licensee's worksheet does not demonstrate that it covered its expenses. The Millstone worksheet shows that *if* the NDT had a balance of \$293 million, *then* it would cover the expenses. In effect, the worksheet added an earnings credit for the PCG. But, since the PCG has no cash, the worksheet included earnings for \$25 million in funds that did not exist in the NDT.

The NRC's Office Instruction, LIC-205, had not been developed when the Millstone license transfer was evaluated. However, the NRC staff re-evaluated the Millstone DFA proposal using the methods of LIC-205, which are presented in Enclosure 6 in the worksheet entitled, "NRC Re-evaluation of Millstone SAFSTOR Cost Analysis (Constant Dollars)." LIC-205 is the method used to determine compliance with the DFA requirements. The worksheet shows that the shortfall was \$77 million, based on the actual NDT starting balance of \$268 million.

The NRC staff computed the shortfall based on nominal dollars, as presented in Enclosure 6 in the worksheet entitled, "NRC Re-evaluation of Millstone SAFSTOR Cost Analysis (Nominal Dollars)." The worksheet is based on the cost escalation and investment fund rate of return as assumed in the Millstone license transfer application. The result shows the nominal dollar shortfall is \$880 million in 2054. However, the nominal dollar shortfall is not used to determine compliance with the regulations. The purpose of computing the nominal dollar value of the shortfall in the Millstone 2001 Order is to show the effects of cost escalation. If a licensee depends on a PCG to cover decommissioning costs, and delays or ceases deposits into its NDT, the unfunded amount can become large.

The table below summarizes the PCGs accepted by the NRC. The shaded cells represent PCGs that were less than the shortfall in DFA that needed to be covered. As seen by inspection, the license transfer orders are inconsistent among themselves. The PCGs for the NMP units covered the shortfall, while the FENOC and Millstone PCGs did not. The inconsistent results indicate that the discounted PCG method is problematic. As explained below, the discounted PCG raises a number of issues that should have been addressed in the evaluation of the licensee's DFA.

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<sup>46</sup> Millstone License Transfer Application, Exhibit L, Decommissioning Funding Worksheet for Unit 1, August 31, 2000 (ML003747539)

## PCGs Used in Three license Transfer Orders Referenced by NEI

Facility	Escalation Method	Discounted PCG Amount	Shortfall Amount
Millstone 1	Constant Dollar	\$26 million	\$77 million
Millstone 1	Nominal Dollar	Not calculated	\$880 million
NMP 1	Constant Dollar	\$54 million	\$40 million
NMP 2	Constant Dollar	\$33 million	\$32 million
FENOC Beaver Valley 1	Constant Dollar	\$67 million	\$87 million
FENOC Beaver Valley 2	Constant Dollar	\$5 million	\$7 million
FENOC Perry	Constant Dollar	\$6 million	\$8 million

The first issue is to define the method used to evaluate the DFA amount provided by the licensee. The method makes a difference in the way that discounting is handled. In the table above, the “escalation method” refers to the method used to evaluate the effect of escalation in decommissioning costs. The “constant dollar” method is used by NRC when it evaluates the adequacy of the DFA submitted by the licensee. The constant dollar method assumes that all costs will remain the same in the future, or, which amounts to the same thing, it assumes that the cost escalation rate is 0%. By holding all costs constant, the method removes the complexity of predicting rates of cost escalation and investment returns. In effect, the constant dollar method applies a discount to all future cash flows back to the date of the calculation, in order to remove the effects of cost escalation. The result can be compared directly to the prescribed amount specified in the formulas of § 50.75(c) to determine if the amount of DFA provided today covers today’s decommissioning cost.

The fact that the cash flows analyzed in the constant dollar method are already discounted to remove the effects of cost escalation is one of the issues that must be considered when evaluating a discounted PCG. The shortfall calculated by constant dollar method has already been discounted. Using the NPV approach would apply a second discount to the shortfall. The NPV approach amounts to taking a double discount on the shortfall, which may result in an inadequate amount of financial assurance.

A second escalation method is to project nominal costs into the future. Nominal costs are future costs that include the effects of inflation and cost escalation.<sup>47</sup> The result is how much decommissioning will cost in the future. The NRC does not use the nominal dollar method for two reasons. First, the prescribed amount specified in the cost formulas of § 50.75(c) estimates the bulk of the decommissioning cost as of today. Thus, the nominal dollar results cannot be directly compared to the regulatory requirement. If the method is used, then the prescribed amount of § 50.75(c) must be escalated to the estimated date of decommissioning, or the cash flows must be discounted back to today’s dollars. Second, the nominal dollar method is forced to make assumptions about rates of cost escalation and investment returns. The assumptions produce variable results. Standardizing the rates by using the constant dollar method produces consistent results. It also allows stakeholders to directly compare the performance of licensees to the DFA requirements.

<sup>47</sup> Inflation normally refers to the general increases in process over time; cost escalation refers to the increases in specific costs, and is not the same as general inflation as measured by the Consumer Price Index. Decommissioning costs, for example, increase over time, but at rates higher than the general inflation rate.

However, the nominal dollar method is useful to understand the size of the future obligations. As shown in Enclosure 6, applying the nominal dollar approach in Millstone order estimates that the future value of the shortfall will be \$880 million.<sup>48</sup> This implies that a discounted PCG will need to increase to a very large amount in the future if the licensee delays or ceases contributions to its NDT. This is a second issue that needs to be addressed with a discounted PCG. The NRC recognized that allowing combinations of the PCG with a NDT provides an incentive to delay or cease contributions to the NDT:

Because of the low costs of guarantees, however, allowing this combination of mechanisms could create an incentive for licensees to delay or cease payments into the sinking fund and, instead, to rely on the guarantee for as much of the cost as possible. Given the magnitude of typical decommissioning costs for reactors, this possibility could hinder the timely conduct of decommissioning. In other words, decommissioning could be significantly delayed if, because of a licensee's inadequate contributions to its sinking fund, a guarantor had to come up with large amounts of money at the time of decommissioning.<sup>49</sup>

The discounted PCG provides greater incentives to delay or cease making contributions to the NDT in two ways. First, using a PCG avoids the expense of making a contribution to the NDT. Second, since the total amount of PCGs is limited by the tangible net worth requirement, the discounted PCG allows the parent to issue more PCGs.

A third issue to be addressed with the discounted PCG, as used in the three license transfer orders, is that it depends on an earnings credit from the PCG to cover the shortfall. However, the PCG has no funds and cannot produce any earnings. The safety evaluation reports (SER) for the three license transfer cases have no discussion on how this issue was resolved.

The NMP submittal contains calculations similar to the Millstone example. However, the NRC staff's re-evaluation of the cash flows determined that the discounted PCGs nevertheless covered the shortfalls, thus meeting the DFA requirements for the units.

A fourth issue with the discounted PCG method becomes apparent by comparing the Millstone and NMP results. Millstone failed to cover the shortfall, while NMP, despite the addition of an earnings credit to the PCG, did cover the shortfall. The reason is that discounting produces variable results depending on the time frame involved. The time frames in the NMP and Millstone orders were different, which led to the NMP PCGs being adequate to cover the shortfall, while the Millstone PCG did not.

The FENOC application did not include worksheets to show how it determined the size of its PCGs. Based on the values submitted, it appears that FENOC determined that that *if* the NDTs for each unit had larger balances as estimated in its application, *then* they would cover the shortfall. In effect, FENOC's determination took an earnings credit for the PCGs; but PCGs cannot produce earnings. The NRC's re-evaluation determined that the PCGs were less than the shortfalls. The FENOC order illustrates a fifth issue with the discounted PCG method – it is misleading to stakeholders because it is not consistent with the NRC's determination of the shortfall. As noted above, the size of the discounted PCG depends on the time period involved. This can mislead stakeholders not only with respect to the size of the shortfall, but also with

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<sup>48</sup> A second example is provided in the Additional Information section titled, "Historical Data." The cost of Calvert Cliffs decommissioning is expected to rise from \$644 million (2005 dollars) to \$5 billion (2033 dollars).

<sup>49</sup> 1998 Decommissioning Rule, 63 FR 50465, 50473

respect to the relative performance between licensees. For example, in the Millstone order, the discounted PCG was smaller than the NMP PCG, yet Millstone had the greater shortfall.

The issues described above need to be addressed when a discounted PCG is evaluated for use as a DFA method.

The process for evaluating “other methods” and combinations of methods is specified in 10 CFR 50.75(e)(1)(vi). In the license transfer orders, the discounted PCG is itself an “other method,” since it is not described in the regulations. The three license transfer orders included a combination of the PCG with the prepayment method. Both these facts indicate the need for evaluation under § 50.75(e)(1)(vi). The orders involved merchant plant licensees. The regulatory guidance of NUREG-1577 states that combinations should be evaluated under § 50.75(e)(1)(vi), and that licensees without access to ratepayer funds (i.e., merchant plants) should receive greater regulatory oversight:

As indicated in 10 CFR 50.75(e)(1)(vi), the reviewer should evaluate other decommissioning funding assurance mechanisms or combinations of mechanisms proposed by licensees or license applicants on a case-by-case basis to determine that the mechanism or combination of mechanisms provide assurance of decommissioning funding equivalent to that provided by the mechanisms specified in 10 CFR 50.75(e) (1)(i) - (v).<sup>50</sup>

The reviewer should exercise greater oversight of those licensees that no longer have such rate regulatory oversight.<sup>51</sup>

FENOC’s application presented an issue that could have been recognized if the provisions of § 50.75(e)(1)(vi) had been applied. In FENOC’s application, the licensee committed to adding \$80 million in cash to its NDTs within 5 years as part of its decommissioning funding.<sup>52</sup>

The FENOC safety evaluation report did not mention the \$80 million commitment. However, as stated in the 1998 Decommissioning Rule, the PCG may provide an incentive to delay or cease payments into the NDT.<sup>53</sup> If the provisions of § 50.75(e)(1)(vi) had been applied, the evaluation would have considered the adverse incentive of the PCG. Equivalency may have been achievable under the specific circumstances of the submittal by requiring FENOC to follow through on its commitment to pay over the \$80 million into its NDTs. The additional funds, if deposited into the NDT, would be eligible for an earnings credit as of the date of the deposit. Adding a condition to require the deposits would have mitigated the incentive to delay or cease payments into the NDTs.

For all of the reasons above, the request to use a discounted PCG should have been evaluated under the provisions of § 50.75(e)(1)(vi).

However, the license transfer SERs invoked § 50.75(e)(1)(iii)(B) to accept the discounted PCG. Apparently, the acceptance was based on adding an earnings credit to the PCG. But subsection (iii)(B) has no provision for discounting or adding an earnings credit to the PCG. It has no provision for the evaluation of combinations. The SERs did not provide the basis for

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<sup>50</sup> NUREG-1577, Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance, Section 2.f(4)

<sup>51</sup> Id. Section 2.c(2)

<sup>52</sup> FENOC Application, Enclosure 1, p.18, April 5, 2005 (ML051450431)

<sup>53</sup> 1998 Decommissioning Rule, 63 FR 50465, 50473

applying § 50.75(e)(1)(iii)(B), and did not address any of the issues concerning the use of a discounted PCG. No analysis was done to determine if the equivalency test of § 50.75(e)(1)(vi) was satisfied. Both the licensee's application and the NRC's safety evaluation report were devoid of any reference to discounting or NPV.

The qualifier, "apparently," used above, was applied to the NRC's acceptance of an earnings credit for the PCG, because the basis documented in the SERs did not state exactly how the earnings credit was evaluated. What is known is that the SERs recited the licensee's estimate of the additional funding assurance that was needed, and stated that the PCG would be provided in that amount. The SERs stated an earnings credit was applied, however, the SERs do not state that it was applied to the PCG. In Millstone, the SER states that earnings on fund balances were considered.<sup>54</sup> In NMP, the SER states that (1) credit for 2% annual real rate of return was taken in calculating the amounts required for the PCG, and (2) the 2% return was factored into the amount that the transferors propose to have placed in the decommissioning trust funds.<sup>55</sup> In FENOC, the SER states that the 2% was applied to the existing funds.<sup>56</sup> The inference from the amounts approved for the PCGs suggests that an earnings credit was applied to the amount of the PCG. However, the SERS did not provide a basis for giving an earnings credit to the PCG, which has no cash and cannot produce earnings.

The conclusion is that the approvals were issued in error. They did not apply the equivalence test required to evaluate the combinations of methods offered by the licensee. In two of the orders, the amount of DFA did not meet the prescribed amount of § 50.75(c). They are not precedents, and NRC is not bound to repeat the errors. As stated in *Cleveland Nat'l Airshow v. US Dept. of Transportation*:

A government agency, like a judge, may correct a mistake, and no principle of administrative law consigns the agency to repeating the mistake into perpetuity.<sup>57</sup>

*Comment 3: Three license transfer orders approved the NPV approach*

NEI stated that the NRC had approved the net present value approach to calculate the amount of decommissioning assurance to be provided by a PCG in the three license transfer orders.

*Response:*

As stated in Comment 2, the NRC staff analysis of the financial assurance combination in the license transfer orders was not documented. In particular, it is impossible to state that the NPV approach was approved. On the contrary, the evidence indicates that the NPV approach was not approved, and not even considered in the orders.

The NPV approach is not specifically described in the NRC's regulations. Therefore, a licensee that desires to use the NPV approach must obtain NRC approval under the equivalence test of § 50.75(e)(1)(vi). However, the transfer request applications do not mention the NPV approach or request approval to use it. NRC's SERs have no reference to the NPV approach. The Transfer Orders makes no mention of the NPV approach in its approval of the transfers. Thus, the Transfer Orders did not approve the NPV approach.

<sup>54</sup> Millstone 2001 Order, SER, p. 8 (ML010160314)

<sup>55</sup> NMP 2001 Order, SER, p.12 (ML011520030)

<sup>56</sup> FENOC 2005 Order, SER, p.8, (ML053460182)

<sup>57</sup> *Cleveland Nat'l Airshow v. US Dept. of Transportation*, 430 F.3d 757, 764-65 (6<sup>th</sup> Cir. 2005)

What the SERs issued with the license transfer orders stated was that an earnings credit had been applied. As discussed in detail in Comments 1 and 2, an earnings credit cannot be applied to a PCG.

*Comment 4: Approval of discounted PCGs was not a mistake*

NEI stated that the approval of discounted PCGs in three license transfer orders was not a mistake. NEI stated that the NRC understood that it approved the PCG after adding an earnings credit and that the PCG needed to be conditioned on an annual review and adjustment. Therefore, the orders establish a precedent that a PCG may be discounted using the NPV approach.

NEI submitted a rebuttal to the legal analysis provided by the New York Attorney General. NEI criticized New York's analysis as stating that the three license transfer orders were inadvertently approved, and that the approvals were *pro forma* issuances in which no position was taken. NEI criticized the NRC for stating that the approvals of the DFA methods in the license transfer orders were made in error.

*Response:*

The response to Comment 2 identifies the errors made in the approval of DFA in the three license transfer orders. The errors exist whether or not the NRC understood that an earnings credit for funds that did not exist was added to the PCG. In each transfer application, the licensee proposed a combination of the PCG and the prepayment method. That combination requires evaluation under the provisions of § 50.75(e)(1)(vi). NEI agreed in its July 13 letter that any combination, other than the external sinking fund and a PCG, is required to obtain approval from NRC under the equivalency test.<sup>58</sup> However, the SER for each order stated that the PCG met the provisions of § 50.75(e)(1)(iii)(B), and did not state that the discounted PCG met the equivalency requirement. As detailed in Comment 2, the approvals erred in several ways. The legal analyses of the New York Office of the Attorney General and NEI are outlined below. The NRC's conclusion follows.

#### I. Analysis by the New York Attorney General<sup>59</sup>

The New York Office of the Attorney General provided its legal analysis concluding that NRC approved the DFA provisions of the three transfers in error. New York states that the law permits NRC to correct its prior mistakes and that sound policy demands it in this instance. The New York Attorney General's analysis is summarized below:<sup>60</sup>

#### 2. The Discounting of Parent Guarantees has no Regulatory Basis and is Contrary to the Plain Text of a Previous NRC Administrative Procedure Act Rulemaking.

- Neither 10 C.F.R. § 50.75(e)(1)(iii)(B), nor the text of Appendix A to 10 C.F.R. Part 30, refer to net present value as an acceptable procedure for valuing the magnitude of the shortfall.
- NRC cannot change the text of a regulation that was developed through an Administrative Procedures Act notice and comment rulemaking process through

<sup>58</sup> NEI, Industry Comments on June 8 workshop, p.10, July 13, 2011 (ML11196A203)

<sup>59</sup> Supplemental Submission by the State of New York Concerning the June 8, 2011 Follow-Up Meeting, p.4 -12, June 27, 2011 ( ML11179A060). The numbering of the outline follows the submittal.

<sup>60</sup> The numbering in the summary follows the outline numbering in the New York submittal

the development of a so-called regulatory “guide.”

2.1. The Plain Language of 10 C.F.R. § 50.75 Permits a 2% Credit Only for Actual Monies Prepaid and Set Aside.

- Despite the absence of any language concerning a 2% credit, licensees argue that NRC should imply a right to discount parent guarantees; that assertion is contrary to the plain text of the regulations.
- 10 C.F.R. § 50.75(e)(1)(vi) allows licensees to combine mechanisms, or propose alternative mechanisms, which must be evaluated by Staff on an *ad hoc* basis.

2.2. The Regulatory History Confirms NRC’s Intent to Allow the 2% Credit Only for Actual Money.

- NRC Staff who participated in the 1998 rulemaking wherein parent guarantees were allowed to be combined with external sinking funds have unequivocally stated that NRC did not intend to allow licensees to discount parent guarantees.

3. The License Transfer Cases Neither Compel the Discounting of Parent Guarantees Nor Prevent NRC from Correctly Applying its Regulations on a Going-Forward Basis.

- Staff acknowledges that licensees were permitted to utilize discounted parent guarantees in those cases, but only in error and in contravention of NRC’s regulations.

3.1 The Backfit Rule is Inapplicable.

- See Decommissioning Planning, Final Rule, 76 FR 35512, 35562

3.2. No Analysis was Performed in the License Transfer Cases.

- Staff merely adopted the position of the licensees in those cases and granted pro forma approval, meaning that Staff never took a position with respect to the appropriateness of discounted parent guarantees.
- Tellingly, Staff uses nearly identical language to that in the application to discuss FENGenCo’s plans to use a parent guarantee.
- Moreover, the passing statements in the license transfer cases cannot explain why the licensee was permitted to discount its parent guarantee, and licensees do not argue that Staff performed any analysis on this issue.

3.3 NRC Staff is not Estopped from Correcting its Past Mistakes.

- It is a longstanding principle of administrative law that NRC Staff cannot be estopped from correcting its mistake.
  - *Utah Power and Light Co. v. U.S.*, 243 U.S. 389 (1917)
  - *Off. of Personnel Mgt. v. Richmond*, 496 U.S. 414 (1990)
- Not only does the law permit Staff to correct its prior mistakes, sound policy demands it in this instance.

The relevant passage from the *Utah* case is reproduced below for convenience:

Of this it is enough to say - that the United States is neither bound nor estopped by acts of its officers or agents in entering into an arrangement or agreement to do or cause to be done what the law does not sanction or permit.<sup>61</sup>

II. Analysis by NEI<sup>62</sup>

The analysis by NEI is outlined below.

<sup>61</sup> *Utah Power and Light Co. v. U.S.*, 243 U.S. 389, 408-409 (1917)

<sup>62</sup> NEI, Industry Comments on June 8 workshop, p.4-8, July 13, 2011 (ML11196A203)

- Approval of the net present value approach in the license transfer orders was not a mistake.

NEI stated that the SERs of the three license transfer orders were clear on their face. NEI presented excerpts of the SERs, and underlined the passages that state an earnings credit had been considered and that annual updating was required. In each order, the SER accepts the licensee's statement of the amount that is needed for the PCG. In the Millstone and FENOC orders, the SER states that an earnings credit was applied to the existing fund balances. In the NMP order, the SER stated that an earnings credit had been taken into account in calculating the amount of the PCG. Each SER states that the PCG was provided pursuant to 10 CFR 50.75(e)(1)(iii)(B). The Millstone order states that the PCG required annual updating under 10 CFR 50.75(f)(1), and that the combination of the PCG and the NDTs must equal or exceed the total amount required under 10 CFR 50.75(b) and (c). The NMP order states that the funding level must be recalculated each year, as required by 10 CFR 50.75(b)(2) and adjusted as necessary. The FENOC order states that funding levels must be recalculated annually and adjusted as necessary to meet the requirements of 10 CFR 50.75.

- NRC regulations expressly authorize the combination of funding methods, including the combination of external sinking funds and parent guarantees.

NEI states that § 50.75(e)(1)(vi) allows combinations in general. NEI agrees that all combinations of methods, with the exception of the external sinking fund and a guarantee, need to be reviewed and approved by the NRC, in accordance with § 50.75(e)(1)(vi).<sup>63</sup> However, NEI states that because the combination of the external sinking fund and a guarantee is placed in the second sentence of paragraph (e)(1)(vi), that particular combination is independent and separate from the equivalency analysis required by the first sentence.

NEI states that the conditions for accepting the combination of an external sinking fund and a guarantee are (1) a PCG is provided and (2) the total amount of funds estimated to be necessary for decommissioning is assured, with the understanding that the total amount will be reduced by a discount computed using NPV. The combination would not require NRC approval or a determination of equivalency in accordance with § 50.75(e)(1)(vi). In NEI's view, the licensee should not be required to perform annual reviews and adjustments. The licensee would only give a commitment to do the reviews and adjustments.

- NEI's conclusion

The three license transfer orders were correctly decided because the NRC understood that it approved the PCG after crediting a 2% real rate of return, and that the PCG needed to be conditioned on an annual review and adjustment. NRC's regulations explicitly allow combinations of the external sinking fund and the PCG. The regulations do not prohibit the NPV approach, and the license transfer orders are precedents for doing so.

### III. NRC Conclusion

The NRC staff concluded that the license transfer orders were erroneously decided with respect to DFA, as detailed in Comment 2. The regulations require combinations of methods submitted by a reactor licensee to be evaluated and approved for equivalency in accordance with § 50.75(e)(1)(vi). Each of the license transfer orders used a combination of the prepayment

<sup>63</sup> NEI, Industry Comments on June 8 Workshop, p.10, July 13, 2011 (ML11196A203)

method, a discounted PCG, and a license amendment to adjust the PCG each year. Both New York and NRC reach the conclusion that the combination used in the three license transfer orders falls within the scope of the equivalency tests requirement. NEI agreed that any combination, other than the external sinking fund and a guarantee, must be evaluated for equivalency under the provisions of 10 CFR 50.75(e)(1)(vi). NEI's agreement implies that the three license transfer orders should have been evaluated for equivalency with the methods of DFA expressly permitted in the regulations. However, the NRC did not perform the necessary evaluation and did not establish the required equivalency in the three license transfer orders. Therefore, the license transfer orders were decided in error.

The three license transfer orders did not approve or even consider approval of the NPV approach. In each instance, the licensee's application, the SER, and the Transfer Order are utterly devoid of any mention of NPV.

NEI's statement that the NRC understood that the three license transfer orders included an earnings credit does not cure the error that the evaluation itself was erroneous. NEI's statement that the staff understood that the PCG had to be conditioned on an annual review and adjustment likewise fails to cure the error. A combination must be evaluated under § 50.75(e)(1)(vi).

Finally, even if the orders were not decided erroneously, they do not establish the discounted PCG or the NPV approach as a precedent for any other order. The Commission stated that precedents with respect to decommissioning funding approvals in license transfer orders are limited to a simple indication of openness to consider non-standard DFA methods.

We see no risk here of a dangerous precedent. In the area of decommissioning funding assurance, each transfer application is examined *on its own facts*. This will be especially true of applications seeking to use an assurance other than those specifically described in sections 50.75(e)(1)(i)-(v). ... Because of the fact-driven nature of our decommissioning rulings in this proceeding, their precedential value is, as a practical matter, limited to an indication of the Commission's openness to funding arrangements not specifically enumerated in subsections (i) - (v).<sup>64</sup> [Emphasis in original]

In summary, the NRC erred when it approved the use of discounted PCGs in the three license transfer orders without performing the equivalency test required by § 50.75(e)(1)(vi). A legal analysis by the State of New York Office of the Attorney General concurs with the staff opinion. NEI's statement that the NRC understood that earnings credits were included in the DFA proposals does not cure the error. The NRC is not required to repeat the errors.

*Comment 5: Combinations of the external sinking fund and a PCG are not subject to the equivalency test*

NEI stated that the first sentence of § 50.75(e)(1)(vi) requires the NRC to apply the equivalency test to combinations and non-standard methods of DFA. However, the combination of an external sinking fund and a guarantee method is placed in the second sentence of subparagraph (vi). NEI stated that because there are two sentences in paragraph (e)(i)(vi), they operate independently. Therefore, no approval or evaluation of equivalence is required for a

<sup>64</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating, Unit No. 3), CLI-00-14, 53 NRC 488, 556-557 (2001)

combination of an external sinking fund and a guarantee method.

*Response:*

The text of the regulation states:

(vi) Any other mechanism, or combination of mechanisms, that provides, as determined by the NRC upon its evaluation of the specific circumstances of each licensee submittal, assurance of decommissioning funding equivalent to that provided by the mechanisms specified in paragraphs (e)(1)(i) through (v) of this section. *Licensees who do not have sources of funding described in paragraph (e)(1)(ii) of this section* may use an external sinking fund in combination with a guarantee mechanism, as specified in paragraph (e)(1)(iii) of this section, provided that the total amount of funds estimated to be necessary for decommissioning is assured. [Emphasis added]

The Statement of Considerations published with the 1998 Decommissioning Rule demonstrates that the second sentence is required to undergo case-by-case evaluation as specified in the first sentence, plus an additional level of oversight. The two sentences of the paragraph work together, not independently.

Notice that the second sentence of paragraph (e)(1)(vi) carves out a subset of merchant plant licensees for consideration. The criterion is, “licensees who do not have the sources of funding described in paragraph (e)(1)(ii).” Paragraph (e)(1)(ii) identifies cost-of-service rate recovery and non-bypassable charges as the sources of funding that must be missing in order to fall within the scope of the second sentence. Cost-of-service rate recovery describes a public utility arrangement, so they are not within the scope of the second sentence. Non-bypassable charges may be collected by either public utilities or merchant plants, if authorized by rate making authority. The only reactor licensees that fall outside the scope of paragraph (e)(1)(ii), and, therefore, fall within the scope of the second sentence of § 50.75(e)(1)(vi), are merchant plants which do not collect non-bypassable charges, and research and test reactors (RTR).

NEI agrees that combinations that fall outside the scope of the second sentence of § 50.75(e)(1)(vi) must be evaluated and approved by the NRC under the equivalency test.<sup>65</sup> The discounted PCG standing alone would fall outside the scope of the second sentence, since it would not be combined with an external sinking fund.

However, even the combination of an external sinking fund and a guarantee must meet the equivalency requirements of the first sentence. In view of the limited scope of the second sentence of § 50.75(e)(1)(vi), NEI’s comment equates to stating that public utility licensees and merchant plant licensees which collect guaranteed sources of revenue specifically reserved for decommissioning are subject to the equivalency test, while merchant plants without access to guaranteed sources of funding are not, when a guarantee is combined with the external sinking fund.

It is unlikely that the NRC intentionally excluded merchant plant licensees with riskier sources of revenue from the equivalency test requirement. The NRC has expressed concerns about DFA methods used by merchant plant licensees. For example, among the comments submitted on the 1998 Decommissioning Rule, NEI requested NRC to use a framework that would allow merchant plant licensees to be included in the range of plants that could use the external

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<sup>65</sup> NEI, Industry Comments on June 8 Workshop, p.10, July 13, 2011 (ML11196A203)

sinking fund.<sup>66</sup> The Commission stated that the NEI proposal would increase the risk of inadequate funding.<sup>67</sup> The NRC chose to limit the number of plants that could use the external sinking fund standing alone.<sup>68</sup> The limitation required merchant plant licensees without authorization to collect non-bypassable charges to pay for decommissioning to obtain NRC approval on a case-by-case basis to use an external sinking fund in combination with a guarantee method under the requirements of § 50.75(e)(1)(vi).<sup>69</sup>

The resolution of the comment is that the second sentence § 50.75(e)(1)(vi) does not operate to exclude any reactors from the equivalency test requirement. To the contrary, by carving out a subset of merchant plant licensees, the second sentence defines a group of licensees subject to an additional level of oversight that must be applied to determine if the combination may be approved.

The discussion in the Supplementary Information for the 1998 Decommissioning Rule states the reasons for the greater level of oversight applied to merchant plants. The Supplementary Information explains that merchant plant licensees (i.e., those that lose the ability to recover decommissioning costs through rates) may be allowed to provide equivalent assurance, but are subject to case-by-case evaluation:

[T]he applicability of the NRC's parent company guarantees and self-guarantees to power reactor licensees is questionable ... because the underlying financial tests were developed primarily for other types of entities assuring smaller decommissioning obligations. Consequently, a case-by-case approach [for] reactor licensees that lose the ability to recover decommissioning costs through regulated rates and fees or other mandatory charges established by a regulatory body or other mandatory charges established by a regulatory body [i.e., merchant plant licensees], could provide assurance equivalent to the other methods NRC is allowing. However, the NRC will need to ensure that the mechanisms used will, in fact, provide adequate financial assurance."<sup>70</sup>

The second reason arises in the event that the licensee fails to complete decommissioning and the parent must step in. The parent, as guarantor, is responsible only for the amount of the PCG. If the licensee has been inefficient in conducting the decommissioning, the PCG may not be enough to complete the project. It is possible that the parent could pay over only the PCG amount, and then claim to have performed its performance guarantee. However, because a merchant plant licensee has no access to ratepayer funds, it would have no means to obtain the additional money needed to complete decommissioning. The third reason arises from the low cost of guarantees. The PCG provides an incentive to shift costs or avoid greater responsibility in the event the licensee is unable to complete the decommissioning:

Because of the low costs of guarantees, however, allowing this combination of mechanisms could create an incentive for licensees to delay or cease payments into the sinking fund and, instead, to rely on the guarantee for as much of the cost as possible. Given the magnitude of typical decommissioning costs for reactors, this possibility could hinder the timely conduct of decommissioning. In other words, decommissioning could be significantly delayed if, because of a

<sup>66</sup> 1998 Decommissioning Rule, 63 FR 50469

<sup>67</sup> Id.

<sup>68</sup> Id.

<sup>69</sup> Id.

<sup>70</sup> 1998 Decommissioning Rule, 63 FR 50473

licensee's inadequate contributions to its sinking fund, a guarantor had to come up with large amounts of money at the time of decommissioning.<sup>71</sup>

These concerns motivated the NRC to add an additional level of oversight for merchant plants that use a guarantee method in combination with the sinking fund, as expressed in the second sentence of § 50.75(e)(1)(vi). The intent is stated in NRC's regulatory guidance on verifying annual amortization amounts for external sinking funds:

As rate deregulation proceeds, some licensees may no longer have rate regulatory oversight with respect to decommissioning. ... The reviewer should exercise greater oversight of those licensees that no longer have such rate regulatory oversight.<sup>72</sup>

In particular, additional oversight is necessary to verify that a merchant plant licensee will, in fact, accumulate the total amount of funds estimated to be necessary for decommissioning if an external sinking fund is used.<sup>73</sup> The reason for the additional oversight is that the external sinking fund, by design, depends on future deposits into the fund to achieve adequate financial assurance. Unlike a prepaid account, the future earnings of the sinking fund do not cover the shortfall between the fund balance and the decommissioning cost. The NRC can rely on rate regulatory authorities to assure that ratepayer funds are properly deposited into a public utility licensee's NDT. However, for the subset of merchant plant licensees that use a combination of the external sinking fund and a guarantee, but have no sources of funding authorized by a rate making authority, the NRC must exercise additional oversight to assure that future deposits are added to the NDT.

*Comment 6: Commitment to annually adjust the discounted PCG is sufficient*

NEI stated that the licensee should be allowed to use a discounted PCG if it makes a commitment to perform annual reviews and adjustments.

*Response:*

A commitment is not a condition; it does not ensure performance. The NRC may impose conditions when needed to achieve the requisite equivalent assurance for combinations of methods.<sup>74</sup> In addition, in the area of decommissioning funding assurance, each application is examined on its own facts.<sup>75</sup> The NRC cannot determine whether annual adjustment is adequate, even when imposed as a condition, without review of the facts of the licensee's submittal. There are several facts that the NRC must consider when evaluating a licensee submittal for equivalency to the DFA methods expressly described in the regulations, as outlined below.

The Enclosure 3 section titled, "1998 Decommissioning Rule," identifies three concerns with

<sup>71</sup> Financial Assurance Requirements for Decommissioning Nuclear Power Reactors, Final Rule, September 22, 1998, 63 FR 50465, 50473

<sup>72</sup> NUREG-1577, Rev. 1, "Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance," Section III.2.c(2), "Verifying Annual Amortization Amounts for External Sinking Funds," 2003

<sup>73</sup> 1998 Decommissioning Rule, 63 FR 50473

<sup>74</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating Unit No. 3), CLI-00-14, 53 NRC 488, 546 (2001)

<sup>75</sup> Entergy Nuclear Operations (James A. Fitzpatrick Nuclear Power Plant; Indian Point Nuclear Generating, Unit No. 3), CLI-00-14, 53 NRC 488, 556-557 (2001) [Hereinafter PASNY transfer case]

allowing the PCG to be used by power reactor licensees.<sup>76</sup>

- Questionable applicability of the PCG's financial test to reactors<sup>77</sup>
- Incentive to shift costs and avoid greater responsibility<sup>78</sup>
- Incentive to delay or cease contributions to the NDT<sup>79</sup>

The Enclosure 3 section titled, "Vulnerabilities of the PCG and Self-guarantee," discusses the risk of non-payment when a PCG is used. Annual adjustments to the discounted PCG do not mitigate those risks. In the PASNY transfer case, the Commission described the guarantee as a "mere promise ... to pay the money at some future time," which provides less assurance than money already deposited in a NDT.<sup>80</sup> The relative lower degree of assurance suggests that conditions are necessary for the discounted PCG.

The licensee is required to provide adequate DFA at all times:

A licensee is required to provide assurance that at any time during the life of the facility, through termination of the license, adequate funds will be available to complete decommissioning. For operating reactors, the amount of decommissioning funding required is generically prescribed in 10 CFR 50.75.<sup>81</sup>

However, as discussed in Comment 2, the ability of the discounted PCG to cover shortfall in DFA, depends, in part, on the time frame involved. A discounted PCG may cover the shortfall when originally approved, but may fail to do so later.

In view of the above discussion, a commitment to annually adjust the discounted amount of a PCG does not provide adequate assurance of DFA. To achieve the requisite equivalent assurance when using a discounted PCG, conditions are needed to ensure performance.

*Comment 7: New York mischaracterizes the NRC's regulations*

NEI stated that the State of New York mischaracterized the NRC's regulations when New York referred to the PCG as a "mere promise to pay" in comments submitted on June 27, 2011.

*Response:*

In its adjudication of the PASNY transfer case, the Commission described the guarantee as a "mere promise ... to pay the money at some future time," which provides less assurance than money already deposited in a NDT.<sup>82</sup> New York described the PCG in the same way.

*Comment 8: New York challenges the NRC's regulations*

NEI stated that the State of New York Office of the Attorney General challenged the NRC's regulations.

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<sup>76</sup> See discussion on 1998 Decommissioning Rule in the enclosed Additional Information

<sup>77</sup> 1998 Decommissioning Rule 63 FR 50465, 50473

<sup>78</sup> Id.

<sup>79</sup> Id.

<sup>80</sup> 53 NRC 488, 550

<sup>81</sup> Decommissioning of Nuclear Power Reactors, Final Rule, 61 FR 39278, July 29, 1996

<sup>82</sup> 53 NRC 488, 550

*Response:*

The New York Office of the Attorney General's statements regarding the NRC's DFA regulations are noted below, along with a response on the merits of the statements.

New York stated:

Neither 10 C.F.R. § 50.75(e)(1)(iii)(B), nor the text of Appendix A to 10 C.F.R. Part 30, refer to net present value as an acceptable procedure for valuing the magnitude of the shortfall. Moreover, nowhere in the relevant regulations is there a reference to, let alone authorization for, net present value for parent guarantees.<sup>83</sup>

Among the conditions contained in the regulations is that a licensee using either the prepayment method or an external sinking fund is allowed to take credit for earnings on those funds using up to a 2 percent annual real rate of return, or a credit of greater than 2 percent if the licensee is a regulated utility and the rate-setting authority has specified a higher rate. 10 C.F.R. §§ 50.75(e)(1)(i), (ii). These two funding mechanisms are distinct from the others mentioned in § 50.75(e)(1) because they require the segregation of actual monies into protected accounts, whereas the other mentioned mechanisms rely on promises to pay. None of the paragraphs wherein provision is made for use of a "promise to pay" mechanism permit a 2% credit.<sup>84</sup>

Reading the text of the regulations demonstrates that the statements are accurate. The regulatory text does not allow sureties, letters of credit, parent company guarantees, self-guarantees, or statements of intent to take an earnings credit.

New York stated:

The regulatory history confirms NRC's intent to allow the 2% credit only for actual money.<sup>85</sup>

The New York Attorney General accurately characterizes the NRC's regulatory history for DFA. As discussed in the enclosed Additional Information section titled, "Regulatory History," the NRC did not intend or permit an earnings credit for any mechanism other than the prepaid account and the external sinking fund. The response to Comment 1 provides additional reasons for concluding that a discounted PCG is not permitted by the regulations.

On the other hand, NEI's discounting proposal does present a challenge to the NRC's regulations. The proposal requests the NRC to grant industry-wide permission to use a decommissioning funding mechanism that is not specifically permitted in the regulations, without NRC approval or evaluation under the equivalency test required by § 50.75(e)(1)(vi). The proposal requests NRC to grant that permission in a guidance document. However, as discussed in the enclosed response to Comment 1, NRC regulations do not permit taking an earnings credit for, or giving a discount on, the PCG. The enclosed Additional Information section titled, "Transfer Orders Applying the Equivalency Test of § 50.75(e)(1)(vi)," discusses

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<sup>83</sup> Supplemental Submission by the State of New York Concerning the June 8, 2011 Follow Up Meeting to the March 2, 2011 Decommissioning Funding Workshop & Related Decommissioning Issues, p.4, June 27, 2011 (ML11179A060) [Hereinafter New York June 2011 Supplemental]

<sup>84</sup> Id. p.5

<sup>85</sup> Id. p.7

the Commission's interpretation that the regulation "plainly establishes an 'equivalence' test." To grant the proposal as requested would require NRC to change its regulation, and the Commission's interpretation of the regulation, without notice-and-comment rulemaking.

NEI stated, in relation to an earlier decommissioning funding issue, that the NRC is not free to change its regulations or its interpretation of the regulations without notice-and-comment rulemaking:

Although courts generally give substantial deference to an agency's interpretation of its own regulations, they have also held that the Administrative Procedure Act requires notice and comment rulemaking when an agency substantially modifies such interpretations. So while an agency's initial interpretation of its regulations is entitled to substantial judicial deference, once an agency gives its regulation one definitive interpretation, it can only change that interpretation as it would formally modify the regulation itself - through the process of notice and comment rulemaking. Accordingly, the Supreme Court has recognized that if an agency adopts "a new position inconsistent with" an existing regulation, or effects a "substantive change in the regulation," notice and comment are required.<sup>86</sup> [Footnotes in original omitted]

*Comment 9: NRC should follow generally accepted accounting practices (GAAP)*

Two industry commenters stated that the NRC's financial assurance regulations do not follow GAAP. The commenters requested that NRC revise its regulations to allow discounting in a manner similar to GAAP.

*Response*

The NRC does not agree that GAAP should be applied to the requirements for DFA. The NRC's regulations protect public health and safety, while GAAP provides cash flow information to interested persons. As noted below, both NRC and the US Government Accountability Office (GAO) have considered and rejected the application of GAAP to DFA.

Since 1973, the Financial Accounting Standards Board (FASB) has been designated by the US Securities and Exchange Commission (SEC) as the private-sector standard setter for GAAP for the United States.<sup>87</sup> NRC considered the FASB standard in the Statement of Considerations published with the 1998 Decommissioning Rule. However, the NRC determined that the NRC's rulemaking could proceed notwithstanding any FASB action. Some commenters on the 1998 Decommissioning Rule generally opposed reporting the status of the NDTs in accordance with GAAP, as stated below:

Some commenters went further, and expressed criticisms of the FASB exposure draft, indicating that even if it became final in its current form they would not find it appropriate for use. In the view of these commenters, merely recognizing the liability and periodic expense for decommissioning, which is the focus of the FASB draft, is not sufficient to ensure adequate funding. In their view, the FASB standards establish accounting procedures but are not the appropriate

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<sup>86</sup> NEI, Revision to Comments on Draft Regulatory Guide DG-1229, Enclosure 1, p.6, September 10, 2009 (ML092590128)

<sup>87</sup> William W. Bratton, "Private Standards, Public Governance: A New Look at the Financial Accounting Standards Board," p. 7, *Boston College L. Rev.*, Vol. 48:1, January 2007

computations for determining necessary cash flows for funding external trusts. One commenter stressed that the focus of the FASB draft, as well as issues concerning the appropriate discount rate, also made the FASB standard questionable for NRC's purposes.<sup>88</sup>

On the specific issue of the discount rate, NRC stated that:

Discount rates are used for capital investment analysis and other decision-making purposes but, if used to calculate contributions to decommissioning funds, could result in financial assurance levels that are not adequate to pay for all assured obligations.<sup>89</sup>

At the time of the 1998 Decommissioning Rule, the FASB standard was still under development. NRC concluded that its decommissioning fund status report requirements would not be affected by the accounting standard when it was eventually developed:

Notwithstanding any final FASB action, the NRC can proceed with its own requirement for reporting on the status of decommissioning funds.<sup>90</sup>

In 2001, GAO completed an audit of NRC's financial assurance oversight program. GAO reviewed the FASB standard and concluded that it was unsuitable as a financial assurance method:

Changes to the Financial Accounting Standards Board's financial reporting standard will require, for the first time, owners of facilities that require significant end-of-life cleanup expenditures—such as nuclear power plants—to consistently report estimated decommissioning costs as liabilities in their financial statements. When this standard takes effect in mid-2002, many companies that are licensed by NRC to own nuclear power plants will have to change their current financial-reporting practices, and the reporting of estimated decommissioning costs will become more uniform. However, the new accounting standard is not intended to, and will not, establish a legal requirement that these licensees set aside adequate funding for decommissioning costs.<sup>91</sup>

The new standard will have no legal or regulatory affect on the actual accumulation of decommissioning funds and is not intended to do so.<sup>92</sup>

Finally, the new accounting standard cannot ensure that funds will be available at the time of decommissioning. Accounting standards are concerned with how financial events and obligations are reported; they do not ensure that resources will be available to pay for future needs, including decommissioning costs.<sup>93</sup>

NRC agreed with GAO that the FASB standard does not assure the availability of adequate decommissioning funds:

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<sup>88</sup> 1998 Decommissioning Rule, 63 FR 50465, 50475

<sup>89</sup> Id. 63 FR 50477

<sup>90</sup> Id. 63 FR 50475

<sup>91</sup> GAO-02-48, Nuclear Regulation: NRC's Assurances of Decommissioning Funding During Utility Restructuring Could be Improved, December 2001, p.5

<sup>92</sup> Id. p.7

<sup>93</sup> Id. p.54

NRC added that the accounting standard and NRC's biennial financial reporting requirements were developed by distinct organizations for different purposes. Finally, NRC said it understands that the purpose of the Financial Accounting Standards Board's standard is to ensure the consistency of financial reporting. The standard is not, NRC added, meant to duplicate NRC's responsibility of assuring the availability of adequate decommissioning funds.<sup>94</sup>

FASB itself recognizes that GAAP should not determine the outcome of business and economic decisions:

The role of financial reporting in the economy is to provide information that is useful in making business and economic decisions, not to determine what those decisions should be.<sup>95</sup>

Furthermore, FASB recognizes that end users of financial reports have a responsibility to do their own independent evaluation of information reported under GAAP, as stated below:

Investors, creditors, and others may use reported earnings and information about the elements of financial statements in various ways to assess the prospects for cash flows. They may wish, for example, to evaluate management's performance, estimate "earning power," predict future earnings, assess risk, or to confirm, change, or reject earlier predictions or assessments. Although financial reporting should provide basic information to aid them, they do their own evaluating, estimating, predicting, assessing, confirming, changing, or rejecting.<sup>96</sup>

The NRC's use of financial information to assess the adequacy of a licensee's DFA is entirely consistent with the FASB's position of the uses of GAAP.

*Comment 10: NRC should apply NPV as if the PCG was cash*

NEI stated that the NRC should allow the licensee to apply the NPV method to discount future cash flows to determine the amount of the PCG today as if the PCG was cash held in a prepayment or external sinking fund.

*Response:*

NPV is a tool for discounted cash flow analysis, widely used for capital budgeting.<sup>97</sup> However, the NRC determined that discounting methods used for capital investment analysis "could result in financial assurance levels that are not adequate to pay for all assured obligations."<sup>98</sup> The license transfer orders discussed in Comment 2 of this paper illustrate that relying on NPV to calculate discounts can result in shortfalls.

A list of reasons why the PCG should not be treated as cash is shown below:

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<sup>94</sup> Id. p.57

<sup>95</sup> Statement of Financial Accounting Concepts No. 1, Objectives of Financial Reporting by Business Enterprises, as amended, FASB, p. 10, November 1978. Available at <http://www.fasb.org>.

<sup>96</sup> Id., p. 2

<sup>97</sup> Net present value, available at [http://en.wikipedia.org/wiki/Net\\_present\\_value](http://en.wikipedia.org/wiki/Net_present_value)

<sup>98</sup> 1998 Decommissioning Rule 63 FR 50465, 50473

- The PCG has no cash associated with it; it cannot generate earnings, and produces no cash flow.
- The NRC uses a constant dollar method to assess the adequacy of DFA. That method implicitly applies a discount to future cash flows to eliminate the effects of cost escalation. Using NPV for DFA would amount to a double discount, which would reduce the amount of DFA to a level less than the prescribed amount of § 50.75(c). See Comment 2 of this paper for a discussion of transfer orders where discounting resulted in licensees failing to cover the shortfall in DFA.
- The NPV method can result in financial assurance levels that are not adequate to meet all future obligations, as demonstrated in SECY-10-0084, Response to Comment 20.<sup>99</sup>
- The NPV method applies to capital investment analysis and other decision making purposes. However, the NRC considered and rejected the use of business decision making discount rates for decommissioning financial assurance purposes in the 1998 Decommissioning Rule.<sup>100</sup>
- NPV varies depending on the future time at which the shortfall occurs, so equal shortfalls may yield different NPVs, which make comparison of licensee performance more complex, and may be misleading to other stakeholders.
- The use of discounted DFA methods reduces the degree of assurance that funds will be available when needed, since it may reduce the ratio of net worth to decommissioning costs.
- The PCG provides an adverse incentive to delay or cease payments into the NDT. A discounted PCG increase the incentive.
- The regulations do not allow treating the PCG as if it were cash.

However, if the NPV approach was applied, the licensee would need to justify its selection of the real rate of return it used to compute the discount. The regulations of allow a rate *up to* 2% real rate of return per year, they do not guarantee it.<sup>101</sup> The licensee cannot simply assert a discount rate of 2% per year without justification. In fact, a negative value can result when the expected growth rate of the NDT lags the cost escalation rate for decommissioning. An example of negative real rate of return is discussed in the Additional Information section titled, "Rate of Return Compared to Decommissioning Cost Escalation." That section includes a discussion of the economic factors that can cause the negative real rate of return.

In view of the actual performance of NDTs compared to decommissioning cost escalation, if the discounting is allowed, the licensee would need to justify its assumptions regarding the real rate of return, under the specific circumstances of its submittal, rather than simply assume a 2% discount rate.

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<sup>99</sup> SECY-10-0084, Enclosure 2, p.36 – 39 (ML101540488)

<sup>100</sup> 1998 Decommissioning Rule, 63 FR 50465, 50477

<sup>101</sup> See § 50.75(e)(1)(i) and (ii). Public utility licensees may use a higher rate, if authorized by their rate regulatory authority.

### Comments on Costs

#### *Comment 11: Direct Costs of the PCG*

At the June 8 follow-up meeting, some licensees stated that the PCG has a direct cost for licensees because the parent company charges its subsidiary-licensee an inter-company fee for the PCG.

#### *Response*

It is difficult to reconcile the comment that the PCG imposes a direct cost with Exelon's statement at the March 2011 workshop that there were no direct costs from using PCGs amounting to \$219 million:

MS. HOFMANN (Vermont Department of Public Service): [W]hat were the specific costs of having those parent guarantees in place?

MR. HAYES (Exelon Treasury Department): To be clear, and for the record, there currently are no direct costs associated with issuing a guarantee so there's not incremental interest that hits your income statement.<sup>102</sup>

NEI agreed that that there is no direct cost for a PCG in its April 2011 letter:

As Mr. Hayes explained ... there is no direct monetary fee for using a PCG ....<sup>103</sup>

The 1993 Self-Guarantee Rule stated that the self-guarantee, which is closely related to the PCG, eliminated costs:

The cost savings would result from the elimination of the cost of third party financial assurance for licensees qualifying to use the self-guarantee.<sup>104</sup>

In addition, the Regulatory Analysis for the 1998 Decommissioning Rule concluded that the PCG would avoid the costs of other mechanisms:

Consequently, licensees that must couple their existing external sinking funds with other mechanisms following deregulation may be able to avoid the costs associated with securing a surety mechanism or prepayment mechanism if they are able to secure a guarantee.<sup>105</sup>

The 1998 Decommissioning Rule was the subject of extensive comments, yet no commenter stated that inter-company fees charged by a parent to its subsidiary-licensee would negate the cost savings of using the PCG.

Referring to the NRC's definition of cost will help reconcile the differing comments on the direct cost of the PCGs:

<sup>102</sup> Common Sessions Transcript, p.145

<sup>103</sup> NEI, Industry Comments on March 2 Workshop, p.1, April 4, 2011 (ML110500002)

<sup>104</sup> 1993 Self-guarantee Rule, 58 FR 68276

<sup>105</sup> SECY-98-0164, Regulatory Analysis on Decommissioning Financial Assurance Implementation Requirements for Nuclear Power Reactors, p. 7 - 8, July 2, 1998 (ML992880091)

[The] cost of a funding method is defined as the incremental revenue requirements that result from using a particular funding method, other factors being equal.<sup>106</sup>

Applying the NRC cost definition to the PCG, the parent company's inter-company fee is not a "cost" since there is no incremental change in the revenue requirements for the family of companies as a whole. The fee represents an inter-company transfer payment, where every dollar paid by the subsidiary is a dollar received by the parent. Since the parent owns the subsidiary, the fee does not change the parent's entitlement, and it does not require the subsidiary to obtain additional revenue to pay the fee. It is the economic equivalent of a person taking a dollar out of his right pocket and placing it his left pocket. An inter-company transfer fee for a PCG does not meet the NRC's definition of cost because there is no incremental revenue needed to pay for it.

Exelon's unqualified statement, supported by NEI, that there are no direct costs or monetary costs to providing a PCG corroborate the NRC's regulatory determinations that the PCG is a minimal cost method to provide DFA.

*Comment 12: Indirect Costs of the PCG*

NEI stated that the PCG imposes "significant indirect costs"<sup>107</sup> on the licensee, due to the requirement to meet the financial test for the PCG.

*Response:*

It is difficult to reconcile the comment that the PCG imposes indirect costs with Exelon's statement at the March 2011 workshop that there were no indirect costs from using PCGs amounting to \$219 million:

MR. FREDRICHS (NRC): But as far as the 219 million dollars in parent company guarantees that you had in place, or may have in place even today, did Exelon actually experience any of the indirect costs that were brought up in earlier NEI comments from last year, restrictions on your liquidity, or credit stress or credit downgradings?

MR. HAYES (Exelon Treasury Department): The quick answer is no, we did not experience any indirect costs for the 219 million. I think, though we [dis]agree for the methodology that was used to calculate the 219, that's not a number that bothers us as much.<sup>108</sup>

NEI's earlier comments stated that the PCG imposed the following list of indirect costs on the licensee in order to pass the financial test for issuing a PCG:

September 10, 2009 letter

- Must set aside assets worth 6 times the amount guaranteed
- Assets set aside may not be pledged as collateral for any other purpose
- Tying up assets leads to credit stress and credit ratings downgrading

<sup>106</sup> 50 FR 5600, 5608

<sup>107</sup> NEI, Revision to Comments on Draft Regulatory Guide DG-1229, Enclosure 1, p.7, September 10, 2009 (ML092590128)

<sup>108</sup> Official Transcript of Proceedings, Decommissioning Funding Workshop, Common Sessions, p. 195, US NRC, March 2, 2011 (ML110810747) [Hereinafter Common Sessions Transcript]

August 4, 2010 letter

- Must have tangible net worth 6 times the amount guarantee

However, the regulations of Appendix A to Part 30, which specify the financial test, do not impose any of the requirements listed by NEI. The licensee is not required to set aside funds, or to tie up assets, or to abstain from pledging assets as collateral for other purposes. In fact, the absence of funds to secure the obligations of the PCG is the reason that earnings cannot be credited to the PCG – there are no funds to produce any earnings. The absence of funds is the reason that discounting the PCG has no economic basis – there is no cash flow to discount. The fact that no assets are set aside to collateralize the PCG is the reason that it is vulnerable to bankruptcy and seizure of assets by creditors. To sum up, the reasons given to support the claim that the PCG has significant indirect costs actually are the reasons the PCG has a minimal cost for the licensee – no cash is required. The features of the PCG that minimize its costs are the sources of its vulnerability as a method of financial assurance.

In addition, the information obtained from the workshops and the NRC's independent research indicates that the PCG does not impose indirect costs. The PCG does not impose a credit stress because payment, if any, is required only after the licensee fails to meet its decommissioning obligation. The PCG cannot be called on during operation, since no decommissioning activities take place during that time. After permanent shutdown, payment can be delayed for up to 60 years, since safe storage is sufficient for the licensee to avoid failure, and it has a relatively low annual cost. Therefore, the likelihood of actual payment is very low for at least 60 years after permanent shutdown.

Since the likelihood of actual payment is very low, and the PCG has no requirements for setting aside funds or assets, it logically follows that there should be no effect on credit stress or credit ratings. Examination of GAAP and parent company financial statements supports the conclusion that the parent's credit ratings are not affected by PCGs. As noted in the response to Comment 16 of this paper, Exelon reported that the PCG has no effect on its asset retirement obligations, as reported in accordance with GAAP. Information on the credit rating process presented by Moody's Investors Service at the March 2011 workshop confirmed the conclusion that the PCG does not affect credit stress or credit ratings. Information from both GAAP and Moody's is summarized below.

The GAAP for PCGs are defined in FASB Interpretation No. 45 (FIN No. 45), "Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others." FIN No. 45 states that guarantees issued between a parent company and its subsidiary are not required to be recognized as a liability on the balance sheet.<sup>109</sup> The PCG fits into the exception established by FIN No. 45, therefore, it is not required to be recorded on the balance sheet as a liability. GAAP require only that the parent include a note in the financial statements that it has issued the PCG.

As discussed in the response to Comment 16 of this paper, Exelon confirmed that its accounting procedures do not recognize the PCG as a liability on the balance sheet, and that the PCG is identified in the notes to the financial statements. As another example, in its 2004 Annual Report, Progress Energy disclosed that it used PCGs for nuclear

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<sup>109</sup> FIN No. 45, p. 4.

decommissioning in a section titled, “Off-Balance Sheet Arrangements and Contractual Obligations.”<sup>110</sup> The PCG is off-balance sheet because it is not recorded as a liability.

A more recent example is provided by FirstEnergy Corp.’s 2008 Annual Report. In 2008, FirstEnergy Corp. used \$2.1 billion in LOCs<sup>111</sup> and, including its subsidiaries, provided \$3.8 billion in guarantees.<sup>112</sup> At the time, FirstEnergy Corp. used an \$80 million PCG for Beaver Valley.<sup>113</sup> The Beaver Valley PCG is small compared to the total amount of guarantees. In addition, FirstEnergy Corp. made the following statement:

We believe the likelihood is remote that such parental guarantees will increase amounts otherwise paid by us to meet our obligations incurred in connection with ongoing energy and energy-related activities.<sup>114</sup>

When reading the FirstEnergy Corp. statement quoted above, the word “remote” is a term of art in accounting use. A loss contingency classified as “remote” is defined as one with only a slight chance of occurring.<sup>115</sup> Accordingly, it does not require recognition on the balance sheet as an accrued liability.<sup>116</sup>

At the March 2011 workshop, Moody’s Investors Service stated the PCG had little effect on the credit rating decision:

[W]hen it comes to the parent guarantee issue, it is not a primary or secondary credit ratings driver for the rating of the company.<sup>117</sup>

Moody’s explained that the method used to determine the size of the PCG likewise has little effect on credit ratings. In discussing whether the PCG is the NPV or the future value, or some other calculation, Moody’s stated:

This is extremely narrow, and focused, and granular in the big picture view of how we are going to assign a rating for an Exelon, or Dominion, or Duke, or Southern Company, or one of the other operating companies that are here. This topic does not get a lot of play in ratings committees with respect to the guarantees. It’s really not that big of an issue from a credit perspective.<sup>118</sup>

The regulatory history of the PCG indicates that the PCG method does not impose indirect costs. The NRC added the PCG method at the request of licensees for materials and research and test reactors when it issued the original financial assurance rules in 1988, on the basis that it would minimize impacts on licensees.<sup>119</sup> Later, in 1998, the NRC extended

<sup>110</sup> Progress Energy 2004 Annual Report, p. 43.

<sup>111</sup> FirstEnergy Corp., 2008 Annual Report, p. 96.

<sup>112</sup> Id. p. 37

<sup>113</sup> Id.

<sup>114</sup> Id.

<sup>115</sup> Preliminary Summary of Financial Accounting Standards for Environmental Liabilities, Intangible Assets and Climate Change Risk, Draft Report, U.S. Environmental Protection Agency, p. 12, April 28, 2008. Available at <http://www.epa.gov>.

<sup>116</sup> Id., p. 13.

<sup>117</sup> Transcript, Decommissioning Funding Workshop, Breakout Session 1, statement of Mr. Hempstead (Moody’s Investor Services), p.91, March 2, 2011 (ML100750351)

<sup>118</sup> Id. p. 86-87

<sup>119</sup> 1988 Decommissioning Rule, 53 FR 24018, 24034 - 35

the use of the PCG to power reactors in response to a comment requesting that action.<sup>120</sup> The NRC stated that the PCG was less costly than other methods of providing DFA.<sup>121</sup> None of the comments received in response to either of the NRC rulemakings made a claim that the PCG imposed significant indirect costs on licensees. Similarly, the U.S. Environmental Protection Agency (EPA) allows PCGs as financial assurance for environmental cleanup obligations.<sup>122</sup> The EPA did not receive comments in its rulemaking activities that claimed the PCG imposed significant indirect costs.<sup>123</sup>

Neither NEI nor any other commenter suggested that Exelon or Moody's erred in their statements that there are no indirect costs to using the PCG. In view of those statements, combined with the actual regulatory requirements, the accounting standards, the financial statements of the licensees' parent companies, the regulatory history, and the low likelihood that the PCG will require actual payment, the reasonable conclusion is that the PCG does not impose indirect costs.

Finally, using the PCG is a voluntary action by the licensee. In the event the circumstances of a particular licensee may result in some indirect cost, the licensee can choose a different DFA method to reduce its indirect cost.

*Comment 13: Availability of Letters of Credit*

Some merchant plant licensees stated they are unable to obtain a letter of credit (LOC) from their bankers.

Reactor licensees state that the low fees paid by materials licensees and their parent companies, as identified in SECY-10-0084, are not always available to them. The reactor licensees state they must pay 1.5% to 4.0% per annum for LOCs and, in some cases, merchant plant licensees cannot obtain LOCs. One large nuclear fleet owner stated that its bankers would not issue LOCs to its reactor licensees due to the regulatory risk of extending credit to non-utility nuclear businesses.<sup>124</sup> The licensee stated:

[A]s someone who has been in the financial/commercial side of this industry for a long time, nuclear -- just the statement "nuclear" makes it different at a bank credit committee. Saying cash flow is attached to a nuclear asset, because of the regulatory history of nuclear assets, will make the banks more hesitant because there is a regulatory risk associated with the cash flows of a nuclear asset -- that are different in a non-nuclear generation asset ....<sup>125</sup>

*Response*

NRC anticipated that some licensees that lose the ability to recover decommissioning costs through rates (i.e., merchant plants) would be considered financially risky ventures by credit providers. The NRC provided the PCG as a low-cost method to meet the DFA requirements in the event a licensee could not obtain a surety or LOC at reasonable cost:

<sup>120</sup> 1998 Decommissioning Rule, 63 FR 50465, 50470 - 71

<sup>121</sup> Id. at 63 FR 50471

<sup>122</sup> 40 CFR 264.143(f)

<sup>123</sup> Personal communication, P. Bailey, ICF Consulting. Mr. Bailey has extensive experience with the NRC and EPA financial assurance regulations. He has provided consulting services to the NRC on many occasions.

<sup>124</sup> Statement of Mr. Green (Entergy), Transcript, June 8, p.18 (ML111650033)

<sup>125</sup> Statement of Mr. Green (Entergy), Transcript, June 8, p.65 (ML111650033)

NRC recognizes that there are likely to be limits on the availability of surety mechanisms such as letters of credit, lines of credit, and, in particular, surety bonds, to licensees trying to demonstrate financial assurance. [Financial] mechanism providers also may view some [merchant plant] licensees ... as financially risky ventures given their restructured operations and newly deregulated financial characteristics (e.g., licensees may no longer have guaranteed service areas). ... Even if surety mechanisms [LOCs and surety bonds] are not available to some licensees, licensees may be able to use ... parent and self-guarantees, which are still less costly.<sup>126</sup>

With respect to the cost of LOCs, a number of sources provide information showing that some parent companies have access to low fees.<sup>127</sup> These sources include parent company filings required by the US Securities and Exchange Commission (SEC) and submittals of financial information to the NRC. These sources revealed that LOCs were available at less than 1% per annum to NRC materials licensees and reactor licensee parent companies. Some large NRC materials licensees, with decommissioning costs comparable to reactors, have stopped using LOCs because they were able to obtain surety bonds at even lower cost, in the range of 0.75% per annum.<sup>128</sup> Entergy Corporation stated it has the ability to issue letters of credit against the total \$3.5 billion borrowing capacity of its credit facility. Entergy Corp.'s weighted average interest rate for the year ended December 31, 2009 was 1.377%.<sup>129</sup> FirstEnergy, also an owner of several reactor licensees, reported a range of LOC costs from 0.35% to 1.70% in 2008.<sup>130</sup> NextEra Energy Inc., parent of Florida Power & Light Co. (FPL), reported that in December 31, 2010 and 2009, the weighted-average interest rate for its commercial paper borrowings were 0.39% (0.26% for FPL) and 0.19% (0.19% for FPL), respectively.<sup>131</sup>

NRC does not require licensee pay for LOCs directly. For example, materials licensees have made arrangements for third parties to obtain a LOC on their behalf. A third party, such as a parent company, may provide an LOC on behalf of the licensee, as long as the LOC conforms to NRC regulations. This arrangement could permit the licensee to obtain the favorable rates available to the licensee's parent company by allowing the parent company's higher credit rating to be used for the benefit of the licensee.

The regulations of 10 CFR 50.75(e)(1)(vi) allow other mechanisms to be used, if they meet tests for equivalency and specific circumstances exist that would support acceptance of another method. The licensee and its parent could propose a financial assurance method to take advantage of low rates available to the parent and submit it for consideration to NRC.

*Comment 14: License renewal provides additional accumulation time*

In its September 2009 comments, NEI stated, "[I]t seems likely that most power reactor licensees will have an additional 20-year time horizon over which to accumulate decommissioning funds."<sup>132</sup>

<sup>126</sup> 1998 Decommissioning Rule, 63 FR 50645, 50471

<sup>127</sup> Response to Comments on Draft Guidance DG-1229, p.15 – 17 (ML101540488)

<sup>128</sup> Proprietary financial information submitted to NRC

<sup>129</sup> Entergy Corporation and Subsidiaries 2009 Annual Report, p.99

<sup>130</sup> FirstEnergy Corporation, 2008 Annual Report, p. 96

<sup>131</sup> Florida Power & Light Co. Form 10-K, p.100, Filed with the US Securities and Exchange Commission (SEC) on February 2, 2011

<sup>132</sup> NEI, Revision to Comments on Draft Regulatory Guide DG-1229, Enclosure 1, p.4, September 10, 2009 (ML092590128)

*Response*

Whether license renewal actually provides additional funds for decommissioning depends on two factors. First, whether license renewal actually provides additional time and, second, whether the return on investment stays ahead of the rate of increase in decommissioning costs. Both factors are uncertain, based on experience.

The additional time available from license renewal is not necessarily 20 years. License renewal merely provides the option of continued operation; it provides no guarantee that operation will actually continue. The record shows that since the License Renewal Rule was issued in 1991,<sup>133</sup> eight power reactors have permanently shut down without applying for license renewal.<sup>134</sup> More recently, the Oyster Creek plant has announced it will not operate through the 20-year license renewal it obtained. Oyster Creek will permanently shut down 10 years early rather than meet the expenses of New Jersey environmental requirements.<sup>135</sup> The State of Vermont has declined to issue a Certificate of Public Good that is required for the Vermont Yankee Power Station to operate during the license renewal period.<sup>136</sup> Whether those decisions will be implemented remains unknown. However, they provide some insight on the uncertainty that additional time will actually be realized from license renewal.

Whether the additional time, if realized, results in funds growing to cover the decommissioning cost is uncertain as well. Information discussed in the Historical Data section of this paper indicate that NDT investment returns have not kept up with decommissioning cost increases in all cases, and that the industry is reducing its contributions into its NDTs. The relative weakness of NDT investment returns was a subject of the March 2011 workshop, as stated by a representative of the Bank of New York - Mellon:

[T]he concern is we have had too many years where costs have exceeded the escalation of asset accumulation. So it is not at all clear to me that license extensions do anything for us. In fact, if cost trends continue the way they are, we get deeper in the hole.<sup>137</sup>

Allowing the use of the discounted PCG will not improve NDT investment performance, even if additional time is available for accumulation. The PCG has no cash and cannot produce earnings, but provides an incentive to delay or cease contributions into the NDT. Consequently, the potential for large unfunded obligations to occur is not mitigated by the potential for license renewal.

*Comment 15: The PCG unduly burdens the licensee*

NEI stated that the PCG was a “substantial additional burden” to the licensee.<sup>138</sup>

*Response:*

As discussed in the response to Comment 11, the PCG reduces costs to the licensee.

<sup>133</sup> Nuclear Power Plant License Renewal, Final Rule, 56 FR 64943, December 13, 1991.

<sup>134</sup> NUREG-1350, Volume 21, 2009–2010 Information Digest, Appendix B, August 2009.

<sup>135</sup> New York Times, Dec. 8, 2010 *available at* <http://www.nytimes.com/2010/12/09/nyregion/09nuke.html>

<sup>136</sup> Letter from United States Senators Leahy and Sanders and United States Representative Welch to NRC Chairman Jaczko, February 28, 2011 (ML110630216)

<sup>137</sup> Transcript, Decommissioning Funding Workshop, Breakout Session 2, statement of Mr. Keller (Bank of New York – Mellon), p. 61, March 2, 2011 (ML110810744)

<sup>138</sup> NEI, SECY-10-0084: Explanation of Changes, p. 9, August 4, 2010 (ML103220322)

With respect to the general burden of compliance with the DFA regulations, NRC determined that the decommissioning cost estimates were reasonable,<sup>139</sup> and that requiring DFA is necessary to protect public health and safety:

In carrying out its licensing and related regulatory responsibilities under these acts, the NRC has determined that there is a significant radiation hazard associated with non-decommissioned nuclear reactors. The NRC has also determined that the public health and safety can best be protected if its regulations require licensees to use methods which provide reasonable assurance that, at the time of termination of operations, adequate funds are available so that decommissioning can be carried out in a safe and timely manner and that lack of funds does not result in delays that may cause potential health and safety problems<sup>140</sup>

The NRC considered the costs of compliance with the DFA rules in the 1988 Decommissioning Rule and determined that they did not impose an undue burden:

[T]he Commission believes that the rule is an equitable means of requiring reasonable assurance of funding for decommissioning without imposing an undue burden on licensees.<sup>141</sup>

Since the original 1988 Decommissioning Rule was issued, the NRC reduced the burden by issuing cost-savings measures in 1993 and 1998, as discussed in the Additional Information section titled, "Regulatory History."

*Comment 16: The PCG overstates decommissioning liability*

NEI stated that the non-discounted PCG overstated the licensee's decommissioning liability.

*Response*

The PCG is not a liability under GAAP. The accounting liability of decommissioning determined by GAAP is independent from the NRC's regulations. Likewise, the amount of the PCG is determined by the cost of decommissioning, independently from accounting standards. Therefore, the licensee's accounting liability for decommissioning does not change whether or not it uses a PCG, it discounts the PCG, or it adds an earnings credit for the PCG.

Information gathered at the March 2011 workshop verified that a PCG does not affect the accounting liability in the parent company's financial statements. The accounting liability for decommissioning is defined by the Statement of Financial Accounting Standards No. 143, "Accounting for Asset Retirement Obligations" (SFAS 143).<sup>142</sup> The standards in SFAS 143 require a company to record its decommissioning liability as an asset retirement obligation (ARO) on its balance sheet using specific procedures based on the amount of the decommissioning cost, the time when the costs will be incurred, and the company's borrowing rate. The relevant point is that the PCG does not affect any of the inputs to the ARO liability. Exelon verified that the PCG does not affect the accounting liability:

<sup>139</sup> 1988 Decommissioning Rule, 53 FR 24028

<sup>140</sup> 1988 Decommissioning Rule, 53 FR 24033

<sup>141</sup> 1988 Decommissioning Rule, 53 FR 24038

<sup>142</sup> R. Schroeder, S. Sevin, K. Yarbrough, "Reporting Effects of SFAS 143 on Nuclear Decommissioning Costs," *Int'l Advances in Econ. Res.*, Vol. 11, p. 450, 2005.

The ARO does not change because of the presence of the parent guarantee.<sup>143</sup>

In addition, the standard for reporting the PCG is defined in FASB Interpretation No. 45 (FIN No. 45), "Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others," issued in November 2002. FIN No. 45 states that guarantees issued between a parent company and its subsidiary are not required to be recognized as a liability on the balance sheet.<sup>144</sup> The PCG is an off balance sheet arrangement that does not change the liabilities on the balance sheet. Exelon verified that the PCGs it issued in 2010 were off-balance sheet arrangements.

MR. FREDRICHS (NRC): [A]re the parent guarantees that you have recognized on the balance sheet or off-balance sheet?

MR. HAYES (Exelon Treasury Department): No, they're currently off-balance sheet. In fact we highlight them in our SEC filings so in our [SEC Form] 10-K ... it's in the notes of the financial statements. We do disclose fully the amount of guarantees that we have outstanding so while they're not included in the calculation of debt they are fully transparent and the public is aware of the amounts ....<sup>145</sup>

The amount of the PCG may not less than the amount prescribed by the formulas specified § 50.75(c). However, the formulas in § 50.75(c) are not affected by the accounting standards, and were intended to be separate from those standards. At the time of the 1998 Decommissioning Rule, the FASB standard was still under development. NRC concluded that the decommissioning fund status report requirements would not be affected by the accounting standard, regardless of the final FASB action:

Notwithstanding any final FASB action, the NRC can proceed with its own requirement for reporting on the status of decommissioning funds.<sup>146</sup>

In view of the above information, it is reasonable to conclude that the PCG does not affect the accounting liability for decommissioning. The amount of the PCG is determined by NRC regulations, independent of accounting standards. The separation is reasonable in view of the fact that NRC's regulations protect public health and safety, while accounting standards report cash flow information of businesses.

*Comment 17: The PCG limits the flexibility of financial operations*

NEI stated that using a PCG limits the flexibility of the parent company's financial operations in order to maintain adequate net worth to pass the financial test for the PCG.

*Response*

This comment puts the cart before the horse by suggesting that the PCG puts limits on the parent's finances. In fact, it is the other way around – the parent's finances limit the amount of PCGs it can issue. No licensee is required to obtain a PCG. A licensee's parent can avoid any potential limitations on its financial operations by choosing not to provide a PCG. Furthermore,

<sup>143</sup> Transcript, March 2 Workshop, statement of Mr. Levin (Exelon), p.152 (ML110810747)

<sup>144</sup> FIN No. 45, p. 4.

<sup>145</sup> Transcript, March 2 Workshop, statement of Mr. Hayes (Exelon), p.152 (ML110810747)

<sup>146</sup> Id. 63 FR 50475

NRC's reactor licensees have a greater degree of flexibility compared to other NRC licensees and companies in other industries required to provide financial responsibility to other Federal agencies. In particular, the need for flexibility was specifically addressed when the NRC issued the 1998 Decommissioning Rule in anticipation of the economic deregulation of the electric generation industry.<sup>147</sup> The NRC increased reactor licensee flexibility by allowing combinations of DFA methods with the PCG.<sup>148</sup> Additional flexibility was provided by allowing both owners and operators of reactors to provided DFA:

Applying financial assurance requirements to both owners and operators provides flexibility, since either can demonstrate compliance.<sup>149</sup>

The NRC's regulations require the parent to pass a financial test to qualify to use the PCG.<sup>150</sup> The parent must possess assets and tangible net worth at least 6 times the amount it will guarantee, and a credit rating of BBB- or better, among other criteria. However, there is no requirement that the parent must "maintain" its net worth, or that it cannot reduce its net worth at any time of its own choosing. If the parent fails to pass the financial test, or chooses to cancel it, the licensee simply establishes DFA using another method.<sup>151</sup>

In order for the PCG to limit the parent's financial operations in some way, the parent must be subject to NRC authority. However, the parent company is not an NRC licensee, and the NRC has no authority over the parent regarding financial assurance, other than what the parent voluntarily accepts in the PCG agreement. Examination of the PCG agreement shows that NRC's authority is limited to two items. First, it can require the parent to pay over the guarantee amount only after the licensee fails to perform its decommissioning activities. That failure cannot happen while the licensee is operating, and may not be evident until 60 years after permanent shutdown. Second, if the parent fails to pass the financial test, and the licensee fails to provide alternative DFA, the NRC can require the parent to provide alternate DFA on the licensee's behalf, or pay over the guaranteed amount. Either way, the parent can operate its business as it chooses. NRC has no authority to dictate the parent's financial operations under the authority of the PCG agreement.

A simple hypothetical will clarify the fact that the PCG places no limits on the parent. For example, suppose the parent company fails the financial test due to losing its investment grade credit rating. Can the NRC force the parent to increase its credit rating, in order to meet the financial test requirement of the PCG in place? The obvious answer is, "No." The PCG does not limit the parent's finances. The situation is just the opposite; the parent's finances limit the PCG.

In addition, the flexibility in financial assurance available to reactor licensees compares favorably with other NRC licensees, and with the flexibility permitted by other Federal agencies that require financial responsibility or site closure and reclamation costs. The table titled, "NRC Compared to Other Federal Agencies on Discounting and Funding Adjustments," compares requirements for trust funds used as financial assurance.

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<sup>147</sup> 1998 Decommissioning Rule, Section 4, Need for General Flexibility, 63 FR 50465, 50468

<sup>148</sup> Id. at 63 FR 50473

<sup>149</sup> Id. at 63 FR 50468

<sup>150</sup> Appendix A to 10 CFR Part 30, Parent Company Guarantee

<sup>151</sup> Id.

### NRC Compared to Other Federal Agencies on Discounting and Funding Adjustments

Agency	Annual Fund Deposits Required	Cost Estimate Discounting Permitted	Funding Adjustment Frequency	Days to Make Adjustment
NRC (Reactors)	No	No	2 years <sup>1</sup>	2 Years Merchant <sup>1</sup> 5 Years Utility <sup>1</sup>
NRC (Other)	Full Amount Up-Front	No	90 days to 1 year <sup>2</sup>	30 to 90 days <sup>2</sup>
EPA	Yes <sup>3</sup>	Municipal Waste – Yes <sup>4</sup> Hazardous Waste – No	1 year	30 days
BLM	Full Amount Up-Front	No	1 year	10 days <sup>5</sup>

Notes: 1. Frequency stated in regulatory guidance  
 2. Frequency stated in regulation  
 3. Pro-rata amount based on years left on permit; no earnings credit allowed  
 4. Discounting permitted only if reviewed by State and cost and timing reasonably known  
 5. BLM allows 10% variance before adjustment is required

The US Environmental Protection Agency (EPA) regulates a variety of substances with potentially adverse environmental impacts, including municipal waste and hazardous waste.<sup>152</sup> With respect to allowing a PCG to grow over time, as proposed by the nuclear industry, the US Environmental Protection Agency (EPA) faced the same question in 1981. EPA refused to allow buildup over time, on grounds that a variety of financial mechanisms was provided to minimize cost. Since the hazardous waste operator is free to choose the mechanism most advantageous to its operation, there was no inequity in refusing to allow PCGs, letters of credit, or sureties to build up over time.<sup>153</sup> The same reasoning applies to the choices available to reactor licensees. The Bureau of Land Management (BLM) regulates mining on public lands, and requires financial guarantees for mining reclamation costs.<sup>154</sup> BLM prohibited the use of PCGs as a financial guarantee mechanism in 2001.<sup>155</sup>

In view of the above, the 1998 Decommissioning Rule increased the flexibility of reactor licensees by allowing the use of the PCG, which had been forbidden before the amendment.

*Comment 18: The PCG has administrative costs*

NEI stated that the PCG has administrative costs, due to use of licensee staff time to prepare the PCG and obtain approval to use it.

#### *Response*

The NRC recognized that combining the PCG with other methods to provide adequate DFA would result in higher administrative costs to licensees. That was the price for obtaining greater flexibility in meeting the DFA requirements:

<sup>152</sup> For financial requirements for site closure, see 40 CFR 258, Subpart G for municipal waste, and 40 CFR, Subpart H for hazardous waste.

<sup>153</sup> Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Consolidated Permit Regulations, Interim Final Rule, January 12, 1981 46 FR 2802, 2823

<sup>154</sup> 43 CFR 3809.500 through 3809.599

<sup>155</sup> 43 CFR 3809.574 (2001)

Allowing combinations of funding methods increases the regulatory flexibility to licensees trying to meet the requirements. (Note, however, that a licensee using a combination of mechanisms faces a greater administrative burden to obtain its mechanisms and, similarly, NRC faces an increased burden in reviewing multiple mechanisms.).<sup>156</sup>

The PCG allows the licensee to eliminate the financing costs of using other methods. The NRC provides templates for the PCG, which help to reduce the administrative effort. The costs of the licensee's internal approval processes are under its control. If the licensee concludes that the savings in financing costs do not justify the administrative cost, it can select a different method to avoid the cost.

*Comment 19: The PCG might limit energy trading activities*

Licensees and NEI stated that the PCG might limit a parent company's ability to engage energy trading activities. The concern is that trading partners may consider the PCG a form of debt, and refuse to enter into trading activities if the amount of the PCGs is too large. If discounted PCGs are used, then the parent can guarantee larger amounts of decommissioning costs with smaller amounts of PCGs. The commenters suggested that the concerns of potential energy trading partners may be reduced if smaller, discounted PCGs are permitted.

*Response*

The PCG does not limit energy trading activities. The situation is the reverse – the parent's energy trading activities may limit the use of the PCG. In addition, increasing the parent's ability to engage in energy trading activities may not be an appropriate basis to allow discounts on PCGs. The PCG is vulnerable to financial stress experienced by the parent, which can reduce the likelihood that funds for decommissioning will be available when needed. As discussed below, energy trading may create risks to the ability of the parent to honor the PCG.

Energy trading was the subject of a Case Study by Dr. Parsons of the Massachusetts Institute of Technology Sloan School of Business.<sup>157</sup> He analyzed the energy trading operations of Constellation Energy Group (CEG), which owns several merchant plant licensees in Maryland and New York. CEG's energy trading operation incurred large losses in 2008. Dr. Parsons stated:

Constellation's crisis [in 2008] illustrates the hidden dangers that arise when a power company's trading operation stops playing a subordinate function and becomes the strategic focus of the business.<sup>158</sup>

The Case Study noted that CEG's stock lost more than 70% of its value in less than two months in 2008, leading to a forced sale at a low price.<sup>159</sup> Within 4 months, CEG's liquidity crisis resulted in a two-notch credit rating downgrade by each of the major agencies.<sup>160</sup>

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<sup>156</sup> Id. at 63 FR 50473

<sup>157</sup> "Do Trading and Power Operations Mix? The Case of Constellation Energy Group 2008," Dr. John E. Parsons, October 2010 *available at* <http://www.mit.edu/~jparsons/Presentations>

<sup>158</sup> Id. p.1

<sup>159</sup> Id.

<sup>160</sup> Constellation Energy Group Overview, RMG Financial Consulting, p.3, July 6,2010 *available at* <http://www.rmgfinancial.com/files/pdfs/Constellation%20Credit%20Review.pdf>

Baltimore Gas & Electric (BGE) is a public utility owned by CEG and located in Maryland. The Maryland Public Service Commission required CEG to take a series of measures that would protect BGE from future risks of energy trading, including ring-fencing measures for purposes of bankruptcy protection and credit rating separation.<sup>161</sup>

### **Comments on the Probability of Funding Success**

*Comment 20: Monte Carlo analysis has no value*

NEI stated that information presented by the US General Accounting Office (GAO) on using the Monte Carlo analysis technique was a purely academic exercise with little or no value to stakeholders.

#### *Response*

Monte Carlo techniques were used by the Federal Reserve Board during the financial crisis of 2008 – 09 as a tool in the stress testing of the banking system.<sup>162</sup> Exelon stated that it used Monte Carlo analysis to evaluate the risks of going forward with the Zion decommissioning project and the license transfer to ZionSolutions.<sup>163</sup> As discussed in the Additional Information section titled, “Financial Assurances Required by Exelon from ZionSolutions, LLC,” Exelon required ZionSolutions to provide an extensive set of financial assurances that exceeded NRC requirements. At the March 2011 workshop, financial advisor for nuclear decommissioning funds presented the technique at the March 2011 workshop to illustrate its applicability to assessing success ratio of meeting the decommissioning funding target.<sup>164</sup> The General Accountability Office (GAO) prepared a Monte Carlo evaluation to assess the risk of depleting a trust fund set up by the United States Government to provide economic self-sufficiency for the Republic of Palau.<sup>165</sup> A risk consultant, formerly employed by GAO, and who has participated in audits of the NRC’s DFA program, presented information showing how Monte Carlo analysis can identify the risk drivers that affect the decision to begin decommissioning immediately after shutdown or delay the start for a period of time.<sup>166</sup> The tool is commonly used by investment advisors in forming retirement plans.

In the decommissioning context, probability models can be used to risk-inform the NRC’s decisions on DFA. For example, Monte Carlo techniques could be useful in screening out non-standard DFA methods with significant risks of shortfalls. The enclosed Additional Information section on Probability Insights provides a discussion of the risks that can be assessed using Monte Carlo methods.

*Comment 21: If probability models are used, NRC should perform the evaluations*

The State of New York Office of the Attorney General stated that licensees have a vested interest in showing a high probability of success in meeting funding goals. Therefore, the model

<sup>161</sup> In The Matter of the Current and Future Financial Condition of Baltimore Gas and Electric Company, Order No. 82986, p.4 - 5, October 30, 2009 available at <http://webapp.psc.state.md.us>, Case No. 9173, Document 218

<sup>162</sup> Board of Governors of the Federal Reserve System, The Supervisory Capital Assessment Program: Design and Implementation, p.13, April 24, 2009 available at <http://www.federalreserve.gov/bankinforeg/bcreg20090424a1.pdf>

<sup>163</sup> Transcript, June 8, 2011 Follow-up Meeting, statement of Mr. Levin, p.110, (ML111650033)

<sup>164</sup> LCG Assoc., Nuclear Decommissioning Trust Asset/Liability Modeling, March 2, 2011 (ML110560778)

<sup>165</sup> Government Accountability Office, Compact of Free Association, Palau’s Use of and Accountability for U.S. Assistance and Prospects for Economic Self-Sufficiency, GAO-08-732, June 2008

<sup>166</sup> Dr. Williams, Monte Carlo Applied to Delayed Decommissioning Decision, June 8, 2011 (ML111600249)

and all its assumptions should be publicly available for testing by interested parties. NRC or outside auditors should perform the evaluations.

*Response*

If probability methods are adopted, the NRC intends perform the evaluations. The models and results would be publicly available.

**Other Comments**

*Comment 22: Spent fuel issues are not germane to funding assurance*

NEI stated that the March 2, 2011 workshop presentation on spent fuel management by the Vermont Department of Public Service was not germane to decommissioning funding assurance.

*Response*

The purpose of the workshop was to gather relevant experts and stakeholders to discuss decommissioning issues of concern to all stakeholders, including the PCG discounting issue raised by the nuclear industry. The workshop attracted a distinguished panel of speakers, and many participants stated that the presentations were highly informative and relevant to their issues.

The issue of funding spent fuel storage often arises in decommissioning discussions. For example, licensees who elect to use SAFSTOR as a means to increase their projected earnings credit must account for the increased storage expenses. A major driver of those expenses is the cost of spent fuel management. A licensee would require an exemption to use decommissioning funds for spent fuel expenses. However, licensees assume that the NDT funds will generate excess earnings that can be used to pay for spent fuel management expenses during SAFSTOR. In addition, many NDTs commingle funds for decommissioning, spent fuel management, and site restoration. The State of New York expressed concerns about commingling and the use of state-regulated funds collected for non-decommissioning purposes being commandeered for decommissioning. The State of Vermont expressed its concerns that the termination of the Yucca Mountain project may well result in spent fuel residing in their State for a much longer time than originally planned. Vermont suggested that NRC consider amending its rules to start planning for spent fuel storage earlier than the current requirement of 5 years before permanent shutdown. The increasing relevance of the issue was recognized by NRC in the recently issued final rule on Decommissioning Planning, which requires decommissioning reactors to provide an annual report on the status of their spent fuel funding plans.<sup>167</sup>

The New York Attorney General stated:

As an initial matter, the State of New York welcomed the opportunity to participate in the public Workshop. The presentations and comments by Staff and the various speakers and attendees provided a transparent forum where a broad spectrum of stakeholders could substantively discuss several key decommissioning issues. The State notes that an open dialogue among Staff and all stakeholders – including the States – about

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<sup>167</sup> Decommissioning Planning, Final Rule, June 17, 2011, 76 FR 35512

multiple issues surrounding decommissioning is in the public interest and could lead to an improvement of the decommissioning process.<sup>168</sup>

Each of the stakeholders presented valid points for NRC consideration. As a government agency, the NRC encourages all stakeholders to present their views, which results in better informed decisions.

*Comment 23: Reactor licensees are meeting the DFA requirements*

NEI stated that reactor licensees of all types (rate-regulated and merchant companies) are meeting NRC requirements.<sup>169</sup>

*Response*

When the NRC issued its 1996 rule on Decommissioning of Nuclear Power Reactors, it stated:

A licensee is required to provide assurance that at any time during the life of the facility, through termination of the license, adequate funds will be available to complete decommissioning.<sup>170</sup>

The NRC reviewed a number of decommissioning fund status reports for several earlier years and determined that the number and duration of shortfalls was greater than previously quantified. For the years 2001 through 2011, reactor facilities had shortfalls on many occasions. The table labeled, "Shortfalls in Financial Assurance Occurring in DFS Reports," quantifies the shortfalls. The shortfalls were measured as of December 31 of the year preceding the DFS report. For example, the shortfalls quantified in the 2009 DFS report were measured as of December 31, 2008. Analysis of the 2009 decommissioning fund status reports indicates that approximately 80% of the \$2.4 billion shortfall was reported by facilities that had delayed or ceased making payments into their NDTs.

**Shortfalls in Financial Assurance Occurring in DFS Reports<sup>171</sup>**

Reporting Year	Number of Facilities with Shortfalls	Shortfalls Resolved in 3 Months	Shortfalls Not Resolved in 1 Year
2001	4	4	0
2003	9	3	0
2005	6	0	6
2006	6	0	6
2007	7	0	0
2009	27	1	6
2010	1	0	1
2011	5	3	--

<sup>168</sup> Comments Submitted by the State of New York, p. 1, April 7, 2011 (ML11030522)

<sup>169</sup> NEI, Industry Comments on March 2 Workshop, p. 3, April 4, 2011 (ML110500002)

<sup>170</sup> Decommissioning of Nuclear Power Reactors, Final Rule, 61 FR 39278, July 29, 1996.

<sup>171</sup> Results compiled from decommissioning fund status reports submitted under § 50.75(f)(1). The table does not include shortfalls addressed in license transfer cases.

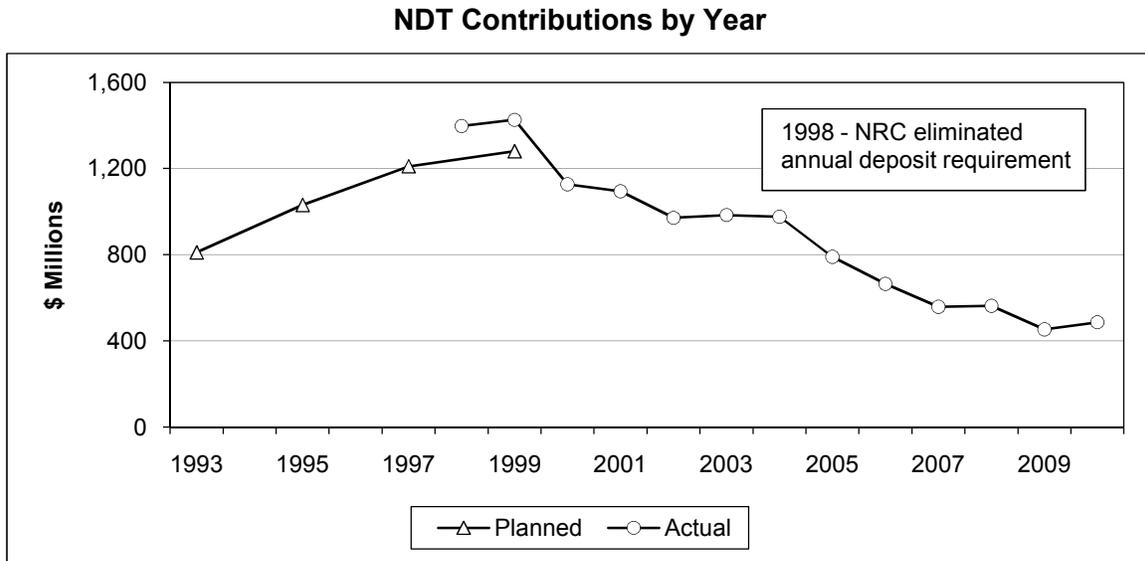
*Comment 24: Reductions in NDT contributions are not an issue*

NEI stated that information presented by Duff & Phelps Investment Management Company (Duff & Phelps) at the March 2011 workshop was incorrect and misleading. NEI specifically objected to two informative slides presented by Duff & Phelps. One slide showed a graph of the trend of declining deposits into the NDTs.<sup>172</sup> The second slide showed that the \$20 billion gap between total NDT assets and total decommissioning costs was nearly the same in 2009 as it was in 2005. NEI pointed out that there are a number of reasons why licensees may be able to reduce their deposits into the NDTs while still maintaining compliance with NRC regulations.

*Response:*

A number of NRC licensees have accumulated adequate funds for decommissioning and do not need to make additional contributions to their NDTs. However, not all licensees are in that situation.

The information presented by Duff & Phelps simply shows the facts of their research. The information needs to be put into context to understand its significance. The graphs below show the longer term trends in NDT contributions, the cost of decommissioning, and the difference between the aggregate NDT assets of the industry and decommissioning costs, which includes information from Duff & Phelps and other sources, including NRC records.



Data on NDT contributions has been collected by Duff & Phelps since 1998.<sup>173</sup> NISA Investments has collected data on planned contributions to NDTs since 1993.<sup>174</sup> When the two datasets are combined, the long term trend shows that contributions increased annually until the NRC eliminated the annual deposit requirement in the 1998 Decommissioning Rule. The trend is illustrated in the “NDT Contributions by Year” chart, which plots planned contributions from 1993 to 1999, and actual contributions from 1998 to 2010. In some cases, the decline after 1998 can be attributed to increasing the NDT in license transfers. Also in 1998, the NRC allowed earnings credits to be added to the NDTs, for up to 60 years after the time of permanent

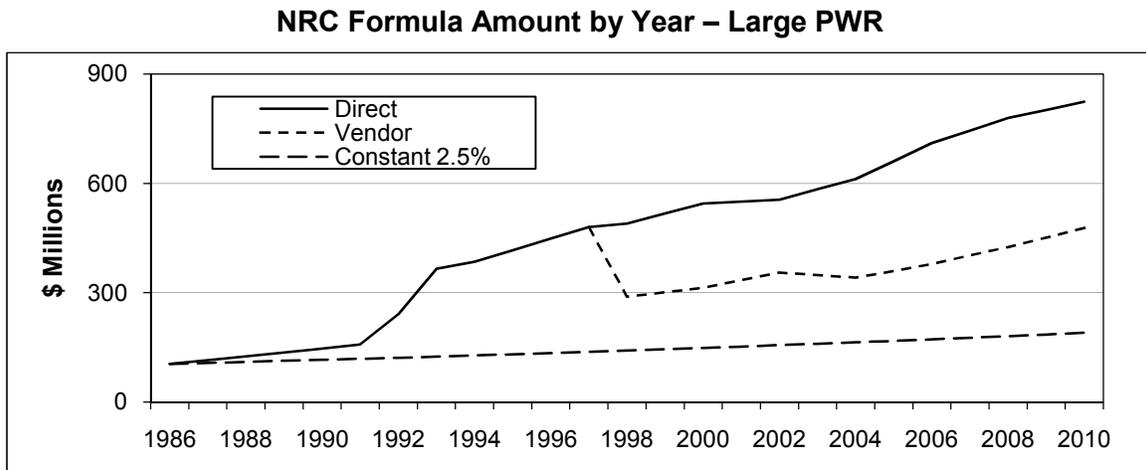
<sup>172</sup> Historical NDT Fund Balances, Annual Contributions and Decommissioning Cost Estimates, Duff & Phelps Investment Management Company, March 2, 2011 (ML110690037)

<sup>173</sup> Duff & Phelps, Historical NDT Contributions, p.3, July 22, 2011 (ML11249A221)

<sup>174</sup> NISA Investment Advisors, 2010 Survey of Trust Sponsors, available at <http://www.nisanet.com>

shutdown. As a result, a licensee could reduce or eliminate its NDT contributions and still meet the NRC's requirements by projecting a longer time horizon for its earnings credit. However, as the regulatory language in 10 CFR 50.75(e)(i) and (ii) states, the licensee is still required to make deposits "such that the amount of funds would be sufficient to pay decommissioning costs at the time permanent termination of operations is expected." The declining contribution trend has continued since 1999.

The "NRC Formula Amount by Year – Large PWR" chart shows the trend in decommissioning costs since 1986.<sup>175</sup> It was prepared by ABZ, Inc. for the March 2011 Decommissioning Funding Workshop. A cost escalation rate of 2.5% per year is shown to approximate a typical rate of increase used in decommissioning cost estimates prepared by licensees. It also approximates the general inflation rate. As the chart shows, in 1998 the NRC revised the minimum required amount by allowing a waste vendor method, which was intended to account for potential cost savings by using volume reduction techniques. The continuing rise of decommissioning costs at a rate greater than general inflation shows the chart's prominent feature.



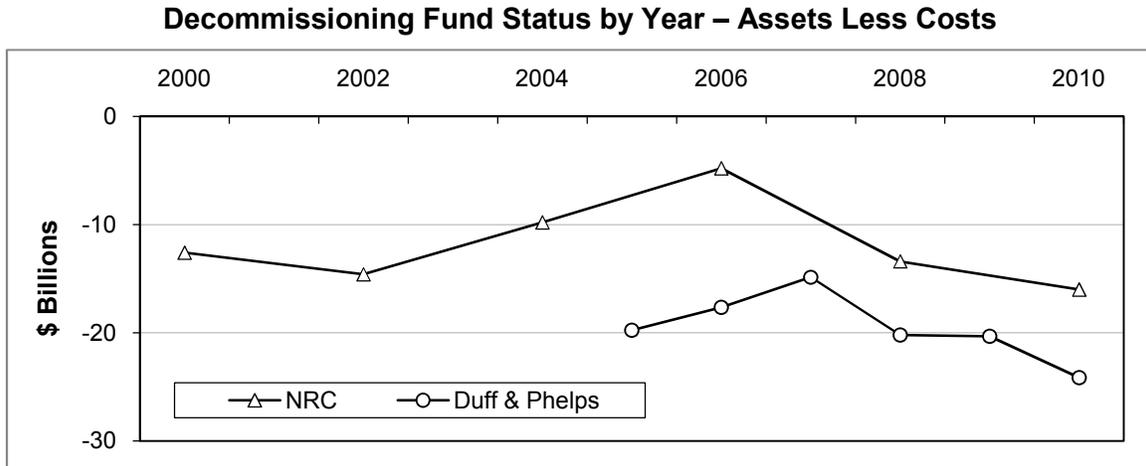
The "Decommissioning Fund Status by Year – Assets Less Costs" chart below shows the longer term trend in the industry-wide aggregated difference between NDT assets and decommissioning costs. Data points are shown to indicate the years for which the differences were calculated. The NRC data is taken from the decommissioning fund status (DFS) reports submitted every two years under § 50.75(f)(1). The Duff & Phelps data for investor owned utilities includes information from filings with the US Securities and Exchange Commission (SEC) and other public sources, as well as NRC DFS reports.<sup>176</sup> The investor-owned utility data generally compares total NDT fund assets to the total cost of decommissioning, rather than the NRC minimum. Both the NDT fund total assets and the total costs may provide for non-decommissioning costs, such as restoring the site to its original condition after the radioactive material is removed. As a result, the Duff & Phelps differences are based on total NDT assets and total costs that often are higher than the NRC minimums. Public power companies are not required to file reports with the SEC. Duff & Phelps uses the public power companies' annual reports and the NRC DFS reports.<sup>177</sup>

<sup>175</sup> ABZ, Inc., Cost Trends in Decommissioning, March 2, 2011 (ML110560598)

<sup>176</sup> Transcript, Decommissioning Funding Workshop, Breakout Session 2, p. 43 - 44, March 2, 2011 (ML110750355)

<sup>177</sup> Id.

The NRC data consistently show smaller differences, based on the DFS reports. However, in the majority of cases, the decommissioning cost in the DFS reports is the NRC minimum requirement rather than a site-specific cost estimate. Recall that the minimum prescribed amount of § 50.75(c) is intended only to represent the “bulk” of decommissioning costs. Site-specific cost estimates by submitted by licensees, where available, typically show higher costs than the NRC minimum. Consequently, the NRC data should be considered a lower bound on the difference between the NDT assets and the actual costs. The Duff & Phelps data may be considered an upper bound on the difference between assets and cost, since they compare higher total assets to higher total decommissioning costs, in most cases. However, both data sets show the same trend.



When the long term trend in NDT assets is compared to the rise in decommissioning costs, it appears that no progress has been made on closing the difference in the last decade. Stated differently, the rise in costs appears to have outpaced the increase in assets. Part of the reason is the declining trend in NDT contributions, which results in lower fund assets than would have been realized if deposits had been made.

This trend is material to the consideration of allowing a discounted PCG as a method to meet the NRC’s DFA requirements. As discussed in Comment 23, shortfalls have occurred during the period contributions have been declining. In 2009, the downward trend in NDT contributions, combined with the market downturn, resulted in shortfalls of approximately \$2.4 billion. Analysis of the 2009 decommissioning fund status reports indicates that approximately 80% of the \$2.4 billion shortfall was reported by facilities that had delayed or ceased payments into their NDTs. While there are several reasons for the 2009 shortfalls, the declining contributions to the NDTs and the rising costs of decommissioning were factors. These factors need to be considered in evaluating a licensee’s request to use a discounted PCG.

*Comment 25: Licensees have not shifted their position*

NEI stated that, contrary to the New York Attorney General’s comment, the licensees have not shifted their position in an effort to justify the net present value approach for discounting the PCG.

*Response:*

With respect to the licensees’ arguments, the New York Attorney General stated:

New York has concerns about licensees' determined efforts to recast the plain regulatory text to allow a corporate parent guarantee to be discounted. As part of this effort, licensees have presented a series of shifting arguments to do that which the regulation does not allow. Those arguments, however, lack any regulatory basis, and are contrary to the Administrative Procedure Act ("APA") rulemaking process that led to the promulgation of the current financial assurance requirements in 1998.<sup>178</sup>

Licensees have set forth two inconsistent justifications for their position that they should be allowed to discount the value of parent guarantees offered as financial assurance. ... First, licensees ascribe significant precedential value to the orders and license amendments associated with three routine license transfer cases in 2001 and 2005. ... Second, upon Staff's attempt to correct the mistake that it made in the license transfer cases, licensees shifted their position, now asserting that regulatory authority to permit discounting of corporate parent guarantees is found in § 50.75(e)(1)(vi).<sup>179</sup>

NEI's positions have changed since it first commented on proposed regulatory guidance in its September 2009 letter. A chronology of NEI's positions follows:

#### Chronology of NEI's Comments on the Process for Discounting the PCG

September 10, 2009, p.10 (ML092590128)

NEI identified three license transfer orders as the process for approving a discounted PCG. No regulatory basis was provided to support the request for allowing a discounted PCG.

August 4, 2010, p.7 - 8 (ML103220322)

NEI stated the three license transfer orders were a precedent. NEI stated that discounting the PCG was acceptable because the PCG was "effectively equivalent" to prepayment of funds into a NDT. NEI requested NRC to apply the NPV method to allow the licensee to use a discounted PCG.

March 8, 2011, p.1 - 2 (ML110690015)

In response to the NRC staff conclusion that the three license transfer orders were erroneously decided, NEI stated § 50.75(e)(1)(iii)(B) allows licensees to use net present value methods to discount the PCG, and was correctly used in the three license transfer orders. NEI stated that neither § 50.75(e)(1)(vi) nor exemptions were required for licensees to use NPV to discount a PCG.

April 4, 2011 (ML111050002)

NEI stated the approach used in the three license transfer orders is acceptable. NEI restated that "regulatory dispensation" (i.e., § 50.75(e)(1)(vi)) is not necessary for the licensee to use a discounted PCG.

July 13, 2011

NEI stated that the discounted PCG is acceptable because earnings credits are authorized for the prepayment and external sinking fund methods under

<sup>178</sup> New York Attorney General, Supplemental Submission Concerning the June 8 Follow-up Meeting, p.1, June 27, 2011 (ML11179A060)

<sup>179</sup> Id. p.5 - 6

§ 50.75(e)(1)(i) and (ii). NEI agreed that all combinations of methods, save one, are subject to the equivalency test of 10 CFR 50.75(e)(1)(vi).<sup>180</sup> The exception is a combination of an external sinking fund, a discounted PCG, and the licensee's commitment to adjust the PCG amount annually to account for changes in decommissioning costs, which is not subject to NRC approval or evaluation of equivalency.

The chronology above shows that NEI's first position relied on the three license transfer orders, with no statement of any regulatory basis to support its discounting request. NEI's first documented view of the NRC's regulations stated that § 50.75(e)(1)(iii)(B) should be applied to allow discounts, and that § 50.75(e)(1)(vi) does not apply. In its final comment, NEI stated that the requirements § 50.75(e)(1)(vi) apply to all combinations of methods, with one exception. NEI suggested that the exception should be the basis to allow licensees to discount the PCG without approval from NRC or evaluation for equivalency with the existing methods specified for DFA.

*Comment 26: Revision to waste vendor option in NUREG-1307*

NRC should issue a draft of NUREG-1307 for comment if the waste vendor option is changed.

*Response*

NRC provided an opportunity for comment on the changes in its March 2, 2011 workshop. Updates to NUREG-1307 are essentially ministerial in nature, consisting of providing examples of how to perform the calculation in § 50.75(c) using updated values from the US Bureau of Labor Statistics and published prices for waste disposal charges. The proposed changes to the waste vendor option are based on information submitted by licensees to NRC. The information demonstrated that the waste vendor option as used by licensees differed significantly from NUREG-1307. The NRC concluded that NUREG-1307 should be revised to include the licensee information. NRC will issue a draft for comment.

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<sup>180</sup> NEI, Industry Comments on June 8 Workshop, p.10, July 13, 2011 (ML11196A203)

QUESTIONS AND ANSWERS ON DECOMMISSIONING FINANCIAL ASSURANCE

OPTIONS TO EVALUATE REQUESTS TO USE DISCOUNTED  
PARENT COMPANY GUARANTEES TO ASSURE FUNDING  
OF DECOMMISSIONING COSTS FOR POWER REACTORS

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## Questions and Answers on Decommissioning Financial Assurance

### 1. Why does the NRC require reactor licensees to provide financial assurance?

The NRC has a statutory duty to protect the public health and safety and the environment. The requirements for financial assurance were issued because inadequate or untimely consideration of decommissioning, specifically in the areas of planning and financial assurance, could result in significant adverse health, safety and environmental impacts. The requirements are based on extensive studies of the technology, safety, and costs of decommissioning (53 FR 24018). The NRC determined that there are significant radiation hazards associated with non-decommissioned nuclear reactors. The NRC also determined that the public health and safety can best be protected if its regulations require licensees to use methods which provide reasonable assurance that, at the time of termination of operations, adequate funds are available so that decommissioning can be carried out in a safe and timely manner and that lack of funds does not result in delays that may cause potential health and safety problems (53 FR 24018, 24033). The purpose of financial assurance is to provide a second line of defense, if the financial operations of the licensee are insufficient, by themselves, to ensure that sufficient funds are available to carry out decommissioning (63 FR 50465, 50473).

### 2. Can a licensee or a parent company meet the financial assurance requirements by submitting its financial statement or indicators of its net worth?

No. In *United States v. Ekco Housewares*, the court held that the defendant could not provide financial assurance by submitting a financial statement or other indicators of its net worth:

In contrast, argues Ekco, its violations merely involved a failure to provide the EPA with financial documentation. Ekco's assessment of the relative seriousness of a violation of the financial responsibility regulations is questionable. These regulations are not mere paperwork requirements, and a party cannot comply by submitting a financial statement or other indicators of its net worth. The purpose of these regulations is to ensure that adequate funds are secured (through, e.g., a letter of credit, guarantee or liability policy) in the present to meet the future financial needs for closing a hazardous waste site and satisfying any third-party claims that might arise therefrom. A present violation of these regulations may significantly impair the ability to close and remediate the site when needed and to protect third parties from harm. This risk of future harm posed by a hazardous waste facility such as that owned by Ekco, found by the district court to present serious risks to human health and the environment, is no less important a consideration than the risk of present harm caused by activities causing contamination. *United States v. Ekco Housewares, Inc.*, 62 F 3d 806, 817 (6th Cir. 1995)

The NRC's financial assurance regulations are modeled on the EPA financial responsibility regulations for hazardous waste operators. (53 FR 24018, 24036) The *Ekco* case provides insight into the appropriate application of financial assurance requirements.

3. A number of parent companies have assets well in excess of the cost of decommissioning. Why doesn't the NRC count those assets as part of financial assurance?

A parent company is not an NRC licensee. The NRC does not have the authority to require a parent company to pay for the decommissioning expenses of its subsidiary-licensee, except to the extent the parent may voluntarily provide a PCG. In addition, the principle that a parent company has no liability for the acts of its subsidiary is recognized by the United States Supreme Court:

It is a general principle of corporate law deeply "ingrained in our economic and legal systems" that a parent corporation (so-called because of control through ownership of another corporation's stock) is not liable for the acts of its subsidiaries. *United States v. Bestfoods*, 524 U.S. 51, 61 (1998)

In view of the absence of authority to compel a parent to pay for the decommissioning costs of its subsidiary-licensee, other than a PCG, if available, there is no assurance that the parent's assets will be used to pay for the subsidiary-licensee's decommissioning costs. Due to that limitation, the licensee must provide assurance that funds will be available using the methods of 10 CFR 50.75.

4. What is a parent company guarantee (PCG)?

The PCG is defined in Appendix A to 10 CFR Part 30. It is a guarantee between the parent and its subsidiary-licensee stating that the parent company will pay a specific amount of the decommissioning costs of its subsidiary-licensee, if the subsidiary-licensee fails to meet its decommissioning obligation. The parent must pass a financial test, which, among other items, requires the parent to possess tangible net worth, assets each worth 6 times the amount guaranteed, and an investment grade credit rating.

The PCG is a non-cash, unsecured promise to pay over funds to the licensee, or a standby trust set up for decommissioning costs, in the event the licensee fails to meet its decommissioning obligation. The parent company has no obligation to pay until after the licensee fails, and no obligation to pay more than the PCG amount. The PCG has no requirements to set aside funds or to provide a security interest or collateral to assure performance of the obligation to pay over the funds when demanded. The PCG places no restrictions on the parent regarding how it uses its assets for any purpose.

The PCG cannot be used to require the parent to pay during operations, since no decommissioning activities are required during that time. After permanent shutdown, the PCG does not compel payment until after the licensee fails to perform its decommissioning activities. The licensee has 60 years to complete decommissioning, which could delay payment on the PCG for 60 years after permanent shutdown.

## 5. What is a discounted PCG?

A discounted PCG guarantees a discounted amount of the decommissioning cost. The discount varies depending on how many years remain before decommissioning starts. A nuclear industry representative suggested using a discount rate of 2% per year. The discount is computed using a non-linear formula, so doubling the years does not double the discount. The table below shows the discount for a number of time periods. For example, assuming decommissioning starts in 20 years, from the DFA requirement would be 33%. Therefore, the discounted PCG would guarantee 67% of the DFA requirement. The table is based on completing decommissioning in one year. In reality, decommissioning takes several years, so the discount in an actual case will be different.

Discount from DFA Requirement @ 2% per Year		
20 Years	40 Years	60 Years
33%	55%	70%

## 6. What is net present value (NPV)?

The following description is taken from Wikipedia.com. In finance, the NPV of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PVs) of the individual cash flows of the same entity. In the case when all future cash flows are incoming (such as coupons and principal of a bond) and the only outflow of cash is the purchase price, the NPV is simply the PV of future cash flows minus the purchase price (which is its own PV). NPV is a central tool in discounted cash flow (DCF) analysis, and is a standard method for using the time value of money to appraise long-term projects. Used for capital budgeting, and widely throughout economics, finance, and accounting, it measures the excess or shortfall of cash flows, in present value terms, once financing charges are met. The NPV of a sequence of cash flows takes as input the cash flows and a discount rate or discount curve and outputs a price.

The equation for the NPV of a series of cash flows is:

$$NPV = \sum_{t=0}^t \frac{R_t}{(1+i)^t}$$

where

$t$  = the time of the cash flow

$i$  = the discount rate (the rate of return that could be earned on an investment in the financial markets with similar risk.), or the opportunity cost of capital

$R_t$  = the net cash flow (the amount of cash, inflow minus outflow) at time  $t$ .

## 7. What is NPV in non-technical terms?

An analogy to a home mortgage may make the concept clearer. The balance on the mortgage is the NPV of the all the remaining payments.

Another example is saving for a child's college education. NPV is the amount of money you need to invest today in order to have enough money to pay for college when the child starts college.

## 8. What is the earnings credit that can be used for decommissioning financial assurance?

The earnings credit recognizes that funds in a nuclear decommissioning trust (NDT) may produce earnings that can be used to pay for decommissioning costs. Reactor licensees are allowed to take a credit for the anticipated future earnings. The credit may be added to their NDT balance to satisfy the NRC's regulations to provide financial assurance for decommissioning costs.

The equation for calculating the earnings credit is:

$$\text{earnings credit} = NDT_{\text{balance}} \{(1 + r)^t - 1\}$$

where

$NDT_{\text{balance}}$  = the balance in the NDT

$r$  = interest rate

$t$  = time.

## 9. What's the difference between NPV and an earnings credit?

The two are used for different purposes. NPV is a decision making tool used for capital investment analysis and other decision making purposes. The earnings credit is a cost-saving measure authorized for reactor licensees to reduce the burden of providing financial assurance for decommissioning costs.

## 10. How are NPV and the earnings credit similar?

Both NPV and the earnings credit can be used to determine what balance is needed in the NDT to satisfy the decommissioning financial assurance (DFA) requirements of the NRC's rules.

## 11. How does NPV relate to discounting?

The NPV equation produces a result that is less than the future cash flow. For example, the balance on a mortgage is always less than the sum of the remaining payments. As a result, NPV is a discounted amount of the future payments. As applied to DFA, NPV gives a discount to the DFA requirement. For example, if the DFA requirement for a new reactor is

\$405 million, the NPV would be \$171 million. However, the NRC's rules do not allow a licensee to provide less than the DFA requirement.

12. What is the flaw in the NPV method when applied to discounting the PCG?

The NPV method applies to cash flows. The PCG has no cash, so there is nothing to discount.

13. What is the flaw in the earnings credit method when applied to the PCG?

An earnings credit recognizes that funds in a NDT may produce earnings that can be used to pay for decommissioning costs. However, the PCG has no cash and cannot produce earnings to pay for decommissioning. The value of the PCG is its face amount, and nothing more.

14. The NRC regulations allow an earnings credit on a trust fund balance, isn't that the same thing as a NPV discount of the PCG?

No. An earnings credit specifically applies to the earnings ability of funds held in an account segregated from licensee assets and outside the administrative control of the licensee and its subsidiaries or affiliates. The credit recognizes that funds held in a NDT may produce earnings if wisely invested. NRC rules allow reactor licensees to add the earnings credit to the trust fund balance. However, since the PCG has no funds, it cannot produce earnings, and there is no credit that can be added.

Net present value (NPV) discounting is an investment tool used to decide whether or not to invest in a project. The NRC rejected the use of investment decision making discount rates as a method to determine financial assurance amounts. As stated in the Supplementary Information of the 1998 Decommissioning Rule, calculating contributions to decommissioning funds based on discount rates used in capital investment analysis can result in financial assurance levels that are not adequate to pay for all assured obligations. (63 FR 50465, 50477) In a number of cases where a licensee proposed to use a discounted PCG, the total amount of DFA including the discounted PCG was not adequate to cover the minimum prescribed amount of the regulations.

15. How would a PCG work if it was applied to a home mortgage?

Using an analogy to a home mortgage, the purchase price of the home represents the decommissioning cost estimate, codified in 10 CFR 50.75(c)(1). The interest on the mortgage represents the escalation in the cost estimate, codified in 10 CFR 50.75(c)(2). The homebuyer represents the licensee, and the homebuyer's parent represents the licensee's parent company.

To use a PCG to purchase a home, the homebuyer would arrange to have his parent give him a guarantee stating that if the homebuyer did not pay the purchase price at the end of the 40-year mortgage, then the parent would pay it. The parent would have to pass a financial test showing that he possessed tangible net worth and assets each at least 6 times

the purchase price. The homebuyer would then present the PCG to the bank to get the mortgage. He would not have to make any payments for one year. Each year after that, the parent would have to pass the financial test and increase the PCG amount to cover the purchase price plus unpaid interest. The homebuyer would present the bank with the updated PCG each year and would not have to make any mortgage payments.

However, in the 40<sup>th</sup> year, when the mortgage comes due, the homeowner can make a choice to extend the repayment period. The PCG has a special property that allows it to be extended for an additional 60 years after the mortgage is due, at the option of the homebuyer. So, when the homebuyer reaches the end of the mortgage period, he can pay up, or continue to keep sending updated PCGs to the bank for the next 60 years and continue to avoid making any mortgage payments. In the 100<sup>th</sup> year, the PCG would equal the purchase price plus unpaid interest. The homebuyer, or his parent, would then have to pay.

16. How would a discounted PCG work if it was applied to a home mortgage?

It would be the same, except that the PCG would have to guarantee only about 16% of the purchase price to start, by immediately electing to use the option to delay payments until 60 years after the end of the mortgage period. At the end of the 40-year mortgage period, the PCG would grow to about 30% of the purchase price plus the unpaid interest. Similar to the full-value PCG, in the 100<sup>th</sup> year, the PCG would equal the purchase price plus unpaid interest.

17. What are the pros and cons of using the PCG as financial assurance, from the licensee and parent company point of view?

An advantage comes from delaying the payment for decommissioning, and avoiding a deposit into the trust fund. By doing so, the licensee or parent may earn a greater return by investing the money in a potentially profitable business project. However, a disadvantage for the parent company is accepting some responsibility for decommissioning the reactor facility, up to the amount of the guarantee.

18. What would happen if the NRC allowed the discounted PCG to be used for DFA?

Due to the low cost of the PCGs, parent companies have an incentive to delay or cease payments into the decommissioning trust funds and rely on the PCG as much as possible. The discounted PCG would allow a parent company to use more PCGs to provide DFA for decommissioning. It can lead to a longer delay or earlier cessation of payments to the NDT.

19. If the PCG is so attractive, then why don't more parent companies use them?

Due to their legacy as rate-regulated public utilities, reactor licensees have accumulated large amounts of funds in their NDTs. In most cases, and most of the time, the projected earnings, combined with ratepayer collections where permitted, are adequate to meet the DFA requirements. The need for PCGs occurs only from time-to-time.

PCGs can be useful when a licensee wants to reduce or delay contributions into its NDT. For example, one parent company provided PCGs in the amount of \$276 million dollars to meet the NRC DFA requirements for several years until it obtained license renewal for three of its reactor facilities. When license renewal was granted, the additional earnings credit during the extra 20 years of operation allowed the licensee to meet the NRC's regulations without adding funds to its NDT. Another parent company provided \$219 million in PCGs to cover market losses in its subsidiary-licensee's NDTs until the NDTs increased in value to meet the NRC requirements. Relatively few licensees carry PCG for long periods of time. However, one applicant for a combined reactor license proposed to use a PCG for the full amount of its DFA requirement, approximately \$400 million.

20. Do the cost formulas of 10 CFR 50.75(c) represent the future cost to decommission a nuclear reactor?

No. The NRC formulas represent the cost to decommission today, not in the future. Due to rising costs, the future value of decommissioning will be much larger than the NRC formula calculated today. For example, using the range of cost escalation rates based on NUREG-1307, the increase in cost over a 20-year license renewal period would range from 2.5 to 5.6 times today's estimated cost, not counting costs that are not included in the formula, such as soil contamination. The rates of increase in decommissioning cost are higher than general inflation.

21. Does the minimum amount of financial assurance for decommissioning provide enough money to pay for decommissioning today?

No. The amount listed as the prescribed amount in 10 CFR 50.75 does not represent the actual cost of decommissioning for specific reactors. It is a reference level established to assure that licensees demonstrate adequate financial responsibility that the bulk of the funds necessary for a safe decommissioning are being considered and planned for early in facility life. Setting aside the bulk of the funds during the life of the facility provides adequate assurance that the facility would not become a risk to public health and safety when it is decommissioned. (53 FR 24018, 24030)

22. What assurance is there that rate regulators will provide funds for decommissioning?

Because public utility commissions set a utility's rates such that all reasonable costs of serving the public may be recovered and because NRC requirements concerning termination of a license are a part of the reasonable cost of having operated a reactor, it is reasonable to assume that added costs beyond those in the prescribed amount could be obtained. (53 FR 24018, 24031) In a number of cases where the licensee was a public utility that shut down prematurely, State Public Utility Commissions have authorized hundreds of millions of dollars in additional rate collections to cover the cost of decommissioning.

23. How does a licensee know what is acceptable as a funding method?

The regulations of 10 CFR 50.75 define the acceptable funding methods. Regulatory guides provide guidance on how the funding methods are to be implemented.

24. What are the NRC's criteria for evaluating funding methods? Which criterion is most important?

The NRC has two primary criteria for evaluating funding methods. The first is the degree of assurance, which measures the effectiveness of a funding method to assure that funds for decommissioning will be available when needed. The second criterion is the cost of providing assurance. From the Commission's perspective, assurance is the most important criterion. (50 FR 5600, 5607)

25. How does the NRC define the cost of a funding method?

The cost of a funding method is defined as the incremental revenue requirements that result from using a particular method, other factors being equal. (50 FR 5600, 5608)

26. How does the PCG save money for the licensee and its owner?

The PCG eliminates the financing fees that the licensee would have to pay if it used a third party issuer to obtain a surety or LOC to cover decommissioning costs. It also allows the licensee to delay or cease payments into its nuclear decommissioning (NDT) trust fund, which eliminates a cost each year that the payments are delayed.

27. What is the basis for limiting the earnings credit to no more than a 2 percent annual real rate of return?

The 2 percent real rate of return is based on historical data on returns from U.S. Treasury issues. It represents as close to the "risk-free" return as possible. The long-term real rate of return on the Treasury issues has ranged from 0.6 percent to 2.1 percent per year, although short-term rates have been higher. The NRC stated that the Treasury rates were expected to be achievable on a more consistent basis than the higher interest rates frequently paid on common stocks and corporate bonds. The NRC stated it would have difficulty justifying a higher rate, due to the requirement to provide reasonable assurance. (63 FR 50465, 50476 - 77) However, if a rate regulatory authority authorizes a higher real rate of return for an NRC licensee, the higher rate will normally be accepted.

28. What is the real rate of return?

It is the return on investment after adjusting for cost escalation.

29. Is it possible for the real rate of return to be less than zero?

Yes. At times the escalation in costs is greater than the return on investment. During those periods, the real rate of return is less than zero, and the nuclear decommissioning trust

(NDT) loses ground to the increasing costs.

30. Has any nuclear decommissioning analysis used a negative real rate of return to calculate the amount of funds needed?

Yes. In 2006 Constellation Energy Group submitted filed a rate case with the Public Service Commission of Maryland for decommissioning costs for the Calvert Cliffs nuclear generating station. The submittal estimated that the after-tax real rate of return for the nuclear decommissioning trust funds was - 0.33% per year.

31. What was the intent of allowing reactor licensees to use PCG as partial satisfaction of the DFA requirement?

In anticipation of the economic deregulation of the electric generation industry, NRC provided a number of lower-cost, flexible methods for reactor licensees to meet the DFA requirements. One of the methods was to allow the combination of a PCG with an external sinking fund, so that merchant plants could gradually build up the sinking fund over time without incurring the financial costs of using LOCs or surety bonds in combination. In the Statement of Considerations to the 1998 Decommissioning Rule, the NRC stated:

The combination of a parent or self-guarantee and an external sinking fund also appears to provide a relatively low-cost means for licensees to demonstrate financial assurance while continuing to gradually fund decommissioning costs over time (either on the current schedule or on an accelerated schedule). (63 FR 50465, 50473)

32. Why does a merchant plant need full up-front financial assurance?

The NRC explained the need for full up-front assurance from merchant plants with the following statement:

For licensees that will not be able to collect funds through such a process [through rates] after industry restructuring, up-front assurance is necessary to ensure that reasonable financial assurance is provided for all decommissioning obligations. In the more competitive environment that is likely to prevail after restructuring, some of these licensees may not remain financially viable for reasons not related to decommissioning financial assurance, further suggesting the need for up-front assurance. (63 FR 50465, 50469)

**EXHIBIT L**

**Decommissioning Funding Worksheet for Unit 1**

**MILLSTONE UNIT 1**

**Balances at Transaction Closing**

Unit 1 Qualified Fund Balance as of 4/01/2001	\$263,177,000
Unit 1 Non-Qualified Fund Balance as of 4/01/2001	\$5,111,000
Unit 1 Guarantee Amount	\$25,423,666
<b>Total Fund Balances at Closing</b>	<b>\$293,711,666</b>

**Millstone Unit 1 Decommissioning Expenditures**

\$700,580,827	TLG Site-specific area-by-area decommissioning cost estimate in 1999 Includes costs to store spent fuel and to restore site to greenfield condition.
\$126,100,000	Expenditures made to bring Unit 1 to "Cold and Dark" SAFSTOR condition
\$70,000,000	Avoided expenditures for Independent Spent Fuel Storage Facility
<u>\$504,480,827</u>	Estimated Decommissioning Cost ("Cold and Dark")
\$2,947,285	Annual monitoring cost during SAFSTOR (2000 \$)
4.50%	Inflation rate
6.50%	After Tax Earnings

Year	Beginning of Year Balance	Earnings <sup>(1)</sup>	Unit 1 Expenditures	End of Year Balance
2001	\$293,711,666	\$14,318,444	\$2,309,935	\$305,720,175
2002	\$305,720,175	\$19,871,811	\$3,218,509	\$322,373,477
2003	\$322,373,477	\$20,954,276	\$3,363,342	\$339,964,411
2004	\$339,964,411	\$22,097,687	\$3,514,692	\$358,547,406
2005	\$358,547,406	\$23,305,581	\$3,672,853	\$378,180,134
2006	\$378,180,134	\$24,581,709	\$3,838,132	\$398,923,711
2007	\$398,923,711	\$25,930,041	\$4,010,848	\$420,842,904
2008	\$420,842,904	\$27,354,789	\$4,191,336	\$444,006,357
2009	\$444,006,357	\$28,860,413	\$4,379,946	\$468,486,825
2010	\$468,486,825	\$30,451,644	\$4,577,043	\$494,361,425
2011	\$494,361,425	\$32,133,493	\$4,783,010	\$521,711,907
2012	\$521,711,907	\$33,911,274	\$4,998,246	\$550,624,935
2013	\$550,624,935	\$35,790,621	\$5,223,167	\$581,192,389
2014	\$581,192,389	\$37,777,505	\$5,458,209	\$613,511,685
2015	\$613,511,685	\$39,878,260	\$5,703,829	\$647,686,115
2016	\$647,686,115	\$42,099,597	\$5,960,501	\$683,825,212
2017	\$683,825,212	\$44,448,639	\$6,228,724	\$722,045,127
2018	\$722,045,127	\$46,932,933	\$6,509,016	\$762,469,043
2019	\$762,469,043	\$49,560,488	\$6,801,922	\$805,227,609
2020	\$805,227,609	\$52,339,795	\$7,108,009	\$850,459,395
2021	\$850,459,395	\$55,279,861	\$7,427,869	\$898,311,387
2022	\$898,311,387	\$58,390,240	\$7,762,123	\$948,939,504
2023	\$948,939,504	\$61,681,068	\$8,111,419	\$1,002,509,153
2024	\$1,002,509,153	\$65,163,095	\$8,476,432	\$1,059,195,816
2025	\$1,059,195,816	\$68,847,728	\$8,857,872	\$1,119,185,672
2026	\$1,119,185,672	\$72,747,069	\$9,256,476	\$1,182,676,264
2027	\$1,182,676,264	\$76,873,957	\$9,673,018	\$1,249,877,204
2028	\$1,249,877,204	\$81,242,018	\$10,108,303	\$1,321,010,919
2029	\$1,321,010,919	\$85,865,710	\$10,563,177	\$1,396,313,452
2030	\$1,396,313,452	\$90,760,374	\$11,038,520	\$1,476,035,306

2031	\$1,476,035,306	\$95,942,295	\$11,535,253	\$1,560,442,348
2032	\$1,560,442,348	\$101,428,753	\$12,054,340	\$1,649,816,761
2033	\$1,649,816,761	\$107,238,089	\$12,596,785	\$1,744,458,065
2034	\$1,744,458,065	\$113,389,774	\$13,163,640	\$1,844,684,199
2035	\$1,844,684,199	\$119,904,473	\$13,756,004	\$1,950,832,668
2036	\$1,950,832,668	\$126,804,123	\$14,375,024	\$2,063,261,767
2037	\$2,063,261,767	\$134,112,015	\$15,021,900	\$2,182,351,881
2038	\$2,182,351,881	\$141,852,872	\$15,697,886	\$2,308,506,867
2039	\$2,308,506,867	\$150,052,946	\$16,404,291	\$2,442,155,523
2040	\$2,442,155,523	\$158,740,109	\$17,142,484	\$2,583,753,148
2041	\$2,583,753,148	\$167,943,955	\$17,913,896	\$2,733,783,207
2042	\$2,733,783,207	\$177,695,908	\$18,720,021	\$2,892,759,094
2043	\$2,892,759,094	\$188,029,341	\$19,562,422	\$3,061,226,013
2044	\$3,061,226,013	\$198,979,691	\$20,442,731	\$3,239,762,973
2045	\$3,239,762,973	\$210,584,593	\$21,362,654	\$3,428,984,912
2046	\$3,428,984,912	\$222,884,019	\$22,323,973	\$3,629,544,958
2047	\$3,629,544,958	\$235,920,422	\$23,328,552	\$3,842,136,829
2048	\$3,842,136,829	\$249,738,894	\$24,378,337	\$4,067,497,385
2049	\$4,067,497,385	\$264,387,330	\$25,475,362	\$4,306,409,353
2050	\$4,306,409,353	\$279,916,608	\$952,369,490	\$3,633,956,472
2051	\$3,633,956,472	\$236,207,171	\$995,226,117	\$2,874,937,526
2052	\$2,874,937,526	\$186,870,939	\$1,040,011,292	\$2,021,797,173
2053	\$2,021,797,173	\$131,416,816	\$1,086,811,800	\$1,066,402,189
2054	\$1,066,402,189	\$69,316,142	\$1,135,718,331	\$0

<sup>(1)</sup> Year 2001 pro rata earnings for 9 month period.

**NRC RE-EVALUATION OF MILLSTONE SAFSTOR COST ANALYSIS  
(CONSTANT DOLLARS)  
June 2011**

**Name of Unit:** Millstone 1  
**Name of Licensee:** Dominion Nuclear Connecticut  
**Transaction Closing Date:** April 1, 2001  
**Actual Fund Balance at Closing:** \$268,288,000  
**Real Rate of Return:** 2.00%  
**Inflation Rate:** 0.00%

<b>Year</b>	<b>Beginning Trust Fund Balance (2001\$)</b>	<b>Unit 1 Expenditures</b>	<b>Real Rate of Return</b>	<b>End of Year Trust Fund Balance (2001\$)</b>
2001	\$268,288,000	\$2,309,935	2.00%	\$271,320,726
2002	\$271,320,726	\$3,079,913	2.00%	\$273,636,428
2003	\$273,636,428	\$3,079,913	2.00%	\$275,998,445
2004	\$275,998,445	\$3,079,913	2.00%	\$278,407,702
2005	\$278,407,702	\$3,079,913	2.00%	\$280,865,144
2006	\$280,865,144	\$3,079,913	2.00%	\$283,371,735
2007	\$283,371,735	\$3,079,913	2.00%	\$285,928,457
2008	\$285,928,457	\$3,079,913	2.00%	\$288,536,314
2009	\$288,536,314	\$3,079,913	2.00%	\$291,196,329
2010	\$291,196,329	\$3,079,913	2.00%	\$293,909,543
2011	\$293,909,543	\$3,079,913	2.00%	\$296,677,023
2012	\$296,677,023	\$3,079,913	2.00%	\$299,499,851
2013	\$299,499,851	\$3,079,913	2.00%	\$302,379,136
2014	\$302,379,136	\$3,079,913	2.00%	\$305,316,007
2015	\$305,316,007	\$3,079,913	2.00%	\$308,311,615
2016	\$308,311,615	\$3,079,913	2.00%	\$311,367,136
2017	\$311,367,136	\$3,079,913	2.00%	\$314,483,766
2018	\$314,483,766	\$3,079,913	2.00%	\$317,662,730
2019	\$317,662,730	\$3,079,913	2.00%	\$320,905,273
2020	\$320,905,273	\$3,079,913	2.00%	\$324,212,666
2021	\$324,212,666	\$3,079,913	2.00%	\$327,586,207
2022	\$327,586,207	\$3,079,913	2.00%	\$331,027,220
2023	\$331,027,220	\$3,079,913	2.00%	\$334,537,052
2024	\$334,537,052	\$3,079,913	2.00%	\$338,117,081
2025	\$338,117,081	\$3,079,913	2.00%	\$341,768,711
2026	\$341,768,711	\$3,079,913	2.00%	\$345,493,373
2027	\$345,493,373	\$3,079,913	2.00%	\$349,292,528
2028	\$349,292,528	\$3,079,913	2.00%	\$353,167,667
2029	\$353,167,667	\$3,079,913	2.00%	\$357,120,308
2030	\$357,120,308	\$3,079,913	2.00%	\$361,152,003

Year	Beginning Trust Fund Balance (2001\$)	Unit 1 Expenditures	Real Rate of Return	End of Year Trust Fund Balance (2001\$)
2031	\$361,152,003	\$3,079,913	2.00%	\$365,264,331
2032	\$365,264,331	\$3,079,913	2.00%	\$369,458,905
2033	\$369,458,905	\$3,079,913	2.00%	\$373,737,372
2034	\$373,737,372	\$3,079,913	2.00%	\$378,101,407
2035	\$378,101,407	\$3,079,913	2.00%	\$382,552,723
2036	\$382,552,723	\$3,079,913	2.00%	\$387,093,066
2037	\$387,093,066	\$3,079,913	2.00%	\$391,724,216
2038	\$391,724,216	\$3,079,913	2.00%	\$396,447,988
2039	\$396,447,988	\$3,079,913	2.00%	\$401,266,236
2040	\$401,266,236	\$3,079,913	2.00%	\$406,180,848
2041	\$406,180,848	\$3,079,913	2.00%	\$411,193,753
2042	\$411,193,753	\$3,079,913	2.00%	\$416,306,916
2043	\$416,306,916	\$3,079,913	2.00%	\$421,522,343
2044	\$421,522,343	\$3,079,913	2.00%	\$426,842,078
2045	\$426,842,078	\$3,079,913	2.00%	\$432,268,207
2046	\$432,268,207	\$3,079,913	2.00%	\$437,802,860
2047	\$437,802,860	\$3,079,913	2.00%	\$443,448,205
2048	\$443,448,205	\$3,079,913	2.00%	\$449,206,457
2049	\$449,206,457	\$3,079,913	2.00%	\$455,079,874
2050	\$455,079,874	\$110,181,135	2.00%	\$352,898,525
2051	\$352,898,525	\$110,181,135	2.00%	\$248,673,549
2052	\$248,673,549	\$110,181,135	2.00%	\$142,364,074
2053	\$142,364,074	\$110,181,135	2.00%	\$33,928,409
2054	\$33,928,409	\$110,181,135	2.00%	(\$76,675,969)
Total		\$701,051,425		

(1) Year 2001 reflects pro rata earnings for 9 month period.

(2) Final balance shows shortfall equal to Beginning Trust Fund Balance + 0.5yr earnings - Expense Per Year (Plant)

**NRC RE-EVALUATION OF MILLSTONE SAFSTOR COST ANALYSIS  
(NOMINAL DOLLARS)  
June 2011**

**Name of Unit:** Millstone Unit 1  
**Name of Licensee:** Dominion Nuclear Connecticut  
**Transaction Closing Date:** April 1, 2001  
**Actual Fund Balance at Closing:** \$268,288,000  
**After Tax Earnings Rate:** 6.50%  
**Inflation Rate:** 4.50%

Year	Beginning Trust Fund Balance	Unit 1 Expenditures	After Tax Earnings Rate	End of Year Trust Fund Balance
2001	\$268,288,000	\$2,309,935	6.50%	\$283,341,712
2002	\$283,341,712	\$3,218,509	6.50%	\$298,435,813
2003	\$298,435,813	\$3,363,342	6.50%	\$314,361,490
2004	\$314,361,490	\$3,514,692	6.50%	\$331,166,067
2005	\$331,166,067	\$3,672,853	6.50%	\$348,899,641
2006	\$348,899,641	\$3,838,132	6.50%	\$367,615,246
2007	\$367,615,246	\$4,010,848	6.50%	\$387,369,037
2008	\$387,369,037	\$4,191,336	6.50%	\$408,220,470
2009	\$408,220,470	\$4,379,946	6.50%	\$430,232,506
2010	\$430,232,506	\$4,577,043	6.50%	\$453,471,822
2011	\$453,471,822	\$4,783,010	6.50%	\$478,009,033
2012	\$478,009,033	\$4,998,246	6.50%	\$503,918,931
2013	\$503,918,931	\$5,223,167	6.50%	\$531,280,742
2014	\$531,280,742	\$5,458,209	6.50%	\$560,178,389
2015	\$560,178,389	\$5,703,829	6.50%	\$590,700,781
2016	\$590,700,781	\$5,960,501	6.50%	\$622,942,114
2017	\$622,942,114	\$6,228,724	6.50%	\$657,002,194
2018	\$657,002,194	\$6,509,016	6.50%	\$692,986,778
2019	\$692,986,778	\$6,801,922	6.50%	\$731,007,934
2020	\$731,007,934	\$7,108,009	6.50%	\$771,184,430
2021	\$771,184,430	\$7,427,869	6.50%	\$813,642,144
2022	\$813,642,144	\$7,762,123	6.50%	\$858,514,491
2023	\$858,514,491	\$8,111,419	6.50%	\$905,942,893
2024	\$905,942,893	\$8,476,432	6.50%	\$956,077,265
2025	\$956,077,265	\$8,857,872	6.50%	\$1,009,076,534
2026	\$1,009,076,534	\$9,256,476	6.50%	\$1,065,109,197
2027	\$1,065,109,197	\$9,673,018	6.50%	\$1,124,353,904
2028	\$1,124,353,904	\$10,108,303	6.50%	\$1,187,000,085
2029	\$1,187,000,085	\$10,563,177	6.50%	\$1,253,248,610
2030	\$1,253,248,610	\$11,038,520	6.50%	\$1,323,312,498

Year	Beginning Trust Fund Balance	Unit 1 Expenditures	After Tax Earnings Rate	End of Year Trust Fund Balance
2031	\$1,323,312,498	\$11,535,253	6.50%	\$1,397,417,662
2032	\$1,397,417,662	\$12,054,340	6.50%	\$1,475,803,704
2033	\$1,475,803,704	\$12,596,785	6.50%	\$1,558,724,764
2034	\$1,558,724,764	\$13,163,640	6.50%	\$1,646,450,415
2035	\$1,646,450,415	\$13,756,004	6.50%	\$1,739,266,618
2036	\$1,739,266,618	\$14,375,024	6.50%	\$1,837,476,736
2037	\$1,837,476,736	\$15,021,900	6.50%	\$1,941,402,612
2038	\$1,941,402,612	\$15,697,886	6.50%	\$2,051,385,714
2039	\$2,051,385,714	\$16,404,291	6.50%	\$2,167,788,355
2040	\$2,167,788,355	\$17,142,484	6.50%	\$2,290,994,984
2041	\$2,290,994,984	\$17,913,896	6.50%	\$2,421,413,560
2042	\$2,421,413,560	\$18,720,021	6.50%	\$2,559,477,020
2043	\$2,559,477,020	\$19,562,422	6.50%	\$2,705,644,825
2044	\$2,705,644,825	\$20,442,731	6.50%	\$2,860,404,619
2045	\$2,860,404,619	\$21,362,654	6.50%	\$3,024,273,979
2046	\$3,024,273,979	\$22,323,973	6.50%	\$3,197,802,286
2047	\$3,197,802,286	\$23,328,552	6.50%	\$3,381,572,704
2048	\$3,381,572,704	\$24,378,337	6.50%	\$3,576,204,297
2049	\$3,576,204,297	\$25,475,362	6.50%	\$3,782,354,265
2050	\$3,782,354,265	\$952,369,490	6.50%	\$3,044,885,794
2051	\$3,044,885,794	\$995,226,117	6.50%	\$2,215,232,405
2052	\$2,215,232,405	\$1,040,011,292	6.50%	\$1,285,410,852
2053	\$1,285,410,852	\$1,086,811,800	6.50%	\$246,829,374
2054	\$246,829,374	\$1,135,718,331	6.50%	(\$880,867,002)
	Total	\$5,732,519,063		

(1) Year 2001 reflects pro rata earnings for 9 month period.

(2) Final balance shows shortfall equal to Beginning Trust Fund Balance + 0.5yr earnings - Expense Per Year (Plant)