

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)