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Mr. G. D. Calkins
Decommissioning Program Manager
Office of Standards Development
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Calkins:

On September 20, 1979 I wrote in response to your request at the Columbia, South Carolina workshop on September 12, 1979 for comments on the draft version of NUREG-0584. I have since been in correspondence with Mr. Wood, the author of the NUREG. In view of the delay in final publication, I would like to take this opportunity to reaffirm some of the comments in my September 20 letter and to provide additional details concerning the revenue requirement aspects of four major decommissioning capital recovery methods and their regulatory and financial significance.

In my October 26, 1979 letter to Mr. Wood I listed, in order of total revenue requirement magnitude over the life of the generating unit, the following major capital recovery methods.

1) Prepayment

2) External funding

3) Internal Funding

4) Negative salvage (straight line depreciation)

I have recently calculated the annual revenue requirements that would result from these four capital recovery methods using the assumptions on attached Table 1 for the immediate removal decommissioning process. The resulting cumulative revenue requirements are plotted on attached Figure 1. The vertical scale relates to the estimated decommissioning costs at current price level, and the horizontal scale relates to the assumed plant life of 10 years. As is readily apparent from

Figure 1, the order of revenue requirement magnitude is as discussed in my letter to Mr. Wood. I have tested this order with as low a plant life as five years, and find it does not change.

While Figure 1 is based on a plant life much shorter than expected, the magnitude relationships will stay the same, and in fact, the difference between negative salvage and the other three methods increases with longer life because the negative salvage method is more sensitive to life than the other three. The annual prepayment and negative salvage revenue requirements decrease each year, while internal and external funding are constant. Internal funding is constant because of the method of determining the sinking fund interest rate. There have been several proposals, and some regulators have adopted use of interest equal to inflation. This would cause internal funding to decrease each year, with the early years showing revenue requirements higher than on Figure 1 and the total revenue requirement less than shown on the Figure.

As can be seen on Figure 1, the annual revenue requirements for negative salvage are quite small by year ten. With a longer life, the annual revenue requirements turn negative because of the depreciation rate being small relative to the rate of return. My prior letters to you and to Mr. Wood pointed out that state and federal service rate regulators base rate case decisions on revenue requirements. The fact that the two funding methods are straight lines and the other methods are curved lines makes it obvious that the relationships between the four methods would be different than shown on Figure 1 if the present value had been plotted.

The calculations for Figure 1 recognize that earnings from an external fund are subject to federal income tax unless investments are in tax exempt securities. If the assumption were made that fund earnings were not taxed, the prepayment method is still the highest and the negative salvage method the lowest, but the spread is reduced. For example, with the fund taxed, the total revenue requirements for the prepayment method are 192% of those for negative salvage and with the fund not taxed, they are 177%. Taxation of fund earnings has more impact on the external methods than the internal. The example on Figure 1 has been calculated assuming the tax benefit from decommissioning cost expenditures is normalized. If normalization is not allowed by regulators, the total revenue requirements would be the same, but the distribution of those revenue requirements over the life of the facility would be such that customers in the early years pay more and customers in existence at the time of decommissioning would reap a significant benefit.

There are a number of good reasons why the financial assurance regulations that might be promulgated by the NRC should give federal and state service rate regulators flexibility in their ability to respond to the utility capital recovery needs; not the least of which is the revenue requirement patterns evident on Figure 1. Since the prepayment method is by far the most expensive capital recovery method, regulators would be expected to have considerable reluctance toward its adoption. Regulators are currently reluctant to adopt the negative salvage method, even though in the long run it is the least expensive for customers, because of the high revenue requirements in early years. Given the political environment under which federal and state service rate regulators function, the internal funding method would likely be attractive. There have already been state regulatory decisions adopting the external funding method. This adoption might not have taken place if all options having regulatory precedent and meeting depreciation accounting principles had been made known.

In addition to being the most expensive for customers, the prepayment method would put unneeded additional pressure on utility requirements for external financing. Available decommissioning cost extimates for the immediate removal process indicate a prepayment from $35 million to $85 million for each nuclear generating unit. Since there are currently about 70 such units licensed to operate in the United States, the financing requirement would vary from $2.45 billion to $5.95 billion. Viewed nationally, such borrowing merely shifts funds from one pocket to another, with significant financing costs being incurred in the process. Some utilities might even be in a situation where their financial condition precludes additional financing. To the extent such situations might exist, the NRC's concern about the financial assurance aspect of decommissioning would be reinforced. In situations where public entities, or entities under different regulatory jurisdictions, are partners in nuclear generating units, their financial and regulatory situations might prompt use of the prepayment method for some of the partners.

The capital recovery issues of decommissioning nuclear power reactors generate a strong case for ensuring that any financial assurance regulations promulgated by the NRC as a result of the policy reevaluation allow state and federal service rate regulators latitude in selecting the appropriate capital recovery method.

Regards,

John Stephenson

JSF/pl

cc: R. S. Wood
P. A. Rock

TABLE 1

Assumptions

Plant life - 10 years.
Immediate removal

Process	Time	Cost
Preparation	1/2 year	X
Removal	1 year	10X

Inflation - 8%
External fund earnings - 10%
Internal fund earnings - R-TIB

$$13.05 - (0.46)(0.50)(11) = 10.52\%$$

Income tax - 46%

Capital	Ratio	Cost
Debt	50%	11%
Preferred stock	15%	13%
Common stock	35%	16%
Composite		13.05%

Tax normalization
Instant regulation

Investing as collected for external methods
Investing at end of plant life for internal methods
Tax benefits available at time of investing

FIGURE 1

Cumulative Revenue Requirements

from
Capital Recovery
for

Immediate Removal Decommissioning Process