

Enclosure 2

NRC Handout

2/27/13





**U.S. NRC**  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
*Protecting People and the Environment*

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**February 27, 2013**



# Overview

- The initiating action SECY-06-0065
- Review of 10 CFR 50.75 (c)
- Sample of staff review process
- PNNL Study
- Questions to gain information



# **Staff Requirements Memorandum**

## **SECY-06-0065**

“In the future (circa 2011) when more cost return information is available, NRR should review the formula used for decommissioning funding requirements and adjust it, if necessary”



## 10 CFR 50.75 Reporting and Recordkeeping for Decommissioning Planning

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

**Millions**

- |                                                         |                                    |
|---------------------------------------------------------|------------------------------------|
| (c)(1)(i) For a PWR: greater than or equal to 3400 Mwt  | <b>\$105</b>                       |
| between 1200 Mwt and 3400 Mwt                           | <b><math>\$(75+0.0088P)</math></b> |
| (For a PWR of less than 1200 Mwt, use P=1200 Mwt)       |                                    |
| (c)(1)(ii) For a BWR: greater than or equal to 3400 Mwt | <b>\$135</b>                       |
| between 1200 Mwt and 3400 Mwt                           | <b><math>\$(104+0.009P)</math></b> |
| (For a BWR of less than 1200 Mwt, use P=1200 Mwt)       |                                    |
- (c)(2) **An adjustment factor** at least equal to  **$0.65 L + 0.13 E + 0.22 B$**  is to be used where L and E are escalation factors for labor and energy, respectively, and are to be taken from regional data of U.S. Department of Labor Bureau of Labor Statistics and B is an escalation factor for waste burial and is to be taken from NRC report **NUREG-1307**, **"Report on Waste Burial Charges."**



## 10 CFR 50.2 Definitions

**Decommission** means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits—

- (1) Release of the property for **unrestricted** use and termination of the license; or
- (2) Release of the property under **restricted** conditions and termination of the license.





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



The Staff Analysis For Finding  
Decommissioning Funding Assurance  
10 CFR 50.75 as it is conducted in license  
transfers amendments, new license  
applications (COL), or  
Biennial Decommissioning Funding Reports



# NRC Staff Analysis

1. If “Actual \$”  $\geq$  “Target \$,” 
2. If “Actual \$” [F/P(i,n)]  $\geq$  “Target \$,” 
3. If “Actual \$” [F/P(i,n)] + “Annuity \$” [F/A(i,n)]  $\geq$  “Target \$,” 
4. If {“Actual \$” [F/P(i,n)] + “Annuity \$” [F/A(i,n)]} + { $\frac{1}{2}$  \$\$ [F/P(2%,7) – 1]}  $\geq$  “Target \$,” 
5. Plus Any Additional Credits Available...



# Minimum Decommissioning Funding Formula - “**Target**”

Aleutian 1 is a PWR rated at 3,700 MWt  
Permanent cessation of operations - 2025

\$105 Million (1986\$) [.65L + .13E + .22B]

[.65(2.39)+.13(2.704)+.22(7.375)]

[1.554 + .352 + 1.623]

\$105 Million x 3.529 = **\$370.5** Million

**2012\$ @ (0.0%,n) = 2025\$**



## **“Actual” Balance As of December 31, 2012**

Aleutian 1 states Actual Balance =  
**\$187.3** Million (2012\$)

- $n = 13$  years left on License
- $i = 2.00\%$  Real Rate of Return
- \$187.3 Million  $[F/P(i,n)]$
- \$187.3 Million  $[1.2935]$

**\$242.3** Million in 2025\$



## Scheduled Annuities

Aleutian 1 states Annuity of **\$9** Million

- $n = 13$  years left on License
- $i = 2.00\%$  Real Rate of Return
- \$9.0 Million  $[F/A(i,n)]$
- \$9.0 Million  $[14.679]$

**\$132.1 Million in 2025\$**



## Decommissioning Funding Assurance

$$\begin{aligned} \text{F/P} &= \$242.3 \text{ Million in 2025\$} \\ + \text{F/A} &= \underline{\$132.1 \text{ Million in 2025\$}} \\ = & \$374.4 \text{ Million in 2025\$} \\ \text{“Target”} & \$370.5 \text{ Million in 2025\$} \end{aligned}$$

**Positive Difference of \$3.9 Million**  
means decommissioning funding  
assurance *as of December 31, 2012*



# PNNL Study Summary

## Inputs

- Available detailed decommissioning cost estimates (19 sites)
- Decommissioning technology and processes
- Decommissioning experience (4 sites)
- Improvements to LLW management and disposal practices
- Impact on estimated costs due to the unavailability of LLW disposal facilities



## Outputs

Revised scaling formula (2010 based \$):

P- Thermal power

PWR: 416 million + 0.023P

BWR: 438 million + 0.025P

Adjustment factor  $0.77 L + 0.06 E + 0.17 B$

PNNL study proposes that the cost estimates for the reference PWR and BWR plants be revised based on the study. The PNNL approach taken is to revise the cost estimate to develop scaling factors by cost category that result in a revised cost estimate for the referenced plants that was in the low end to below average of the estimated/actual costs reviewed in the study, with a greater emphasis placed on actual reported costs when available.



## PNNL Proposal as It Could be for 10 CFR 50.75(c)

(c) Table of minimum amounts (**January 2010 dollars**) required to demonstrate reasonable assurance of funds for decommissioning by reactor type and power level, P (in Mwt); adjustment factor.

***Millions***

(c)(1)(i) For a PWR:	greater than or equal to 3400 Mwt	\$494
	between 1200 Mwt and 3400 Mwt	$\$416 + (0.023 \times P)$
	(For a PWR of less than 1200 Mwt, use P=1200 Mwt)	
(c)(1)(ii) For a BWR:	greater than or equal to 3400 Mwt	\$523
	between 1200 Mwt and 3400 Mwt	$\$438 + (0.025 \times P)$
	(For a BWR of less than 1200 Mwt, use P=1200 Mwt)	

(c)(2) **An adjustment factor** at least equal to  **$0.77 L + 0.06 E + 0.17 B$**  is to be used where L and E are escalation factors for labor and energy, respectively, and are to be taken from regional data of U.S. Department of Labor Bureau of Labor Statistics and B is an escalation factor for waste burial and is to be taken from NRC report **NUREG-1307**, **"Report on Waste Burial Charges."**



## Questions to Solicit Information:

- Would the formula benefit from adjustments? What issues would the adjustment address?
- Do the current formula and a site-specific study address the requirement to ensure funding is available for full radiological decommissioning?
- What has changed, if anything, whereby the formula needs adjusting?
- Might stakeholders benefit from the minimum amount being adjusted to 2010 dollars?