REGULATORY ANALYSIS

PROPOSED RULE

FINANCIAL ASSURANCE AMENDMENTS FOR
MATERIALS LICENSEES

I. Regulatory Problems to be Addressed by This Proposed Rule

The NRC regulations requiring financial assurance for decommissioning are designed to assure that adequate funding will be available for timely decommissioning by licensees. The financial assurance regulations are part of the overall NRC strategy to maintain safety and protection of the environment during decommissioning and decontamination of nuclear facilities.

Financial assurance is composed of several parts: (1) appropriate identification of licensees for which financial assurance should be required; (2) the amount of financial assurance required for each licensee must be adequate to fund current decommissioning costs; and (3) appropriate financial assurance mechanisms (surety bonds, escrow accounts, parent or self-guarantee, etc.) must be required.

The NRC is proposing to amend its financial assurance requirements for certain materials licensees to bring required financial assurance amounts more in line with actual current decommissioning costs. The objective of this rulemaking is to maintain adequate financial assurance by addressing gaps in the current regulatory framework regarding (1) and (2) above.

Under current regulations, materials licensees using substantial quantities of nuclear materials must provide financial assurance for decommissioning (most materials licensees do not need to provide financial assurance because their possession limits are below the threshold for requiring financial assurance). Approximately 490, or about 10 percent, of the NRC's materials licensees require financial assurance. The financial assurance requirements were

promulgated in 1988 as part of the decommissioning rulemaking (53 FR 24018, June 27, 1988). Revision to some of the financial assurance requirements for materials licensees are needed because there have been changes in decommissioning costs since that time, and experience has revealed that for certain types of licensees, such as waste brokers, special considerations exist which require different treatment.

II. Current Rule Requirements

A. 10 CFR Part 30

10 CFR Part 30 requires a licensee authorized to possess very large quantities of unsealed byproduct material to submit a decommissioning funding plan which includes a site-specific decommissioning cost estimate.

Part 30 licensees authorized to possess lesser amounts of unsealed byproduct material, but above the threshold for financial assurance, may either submit a decommissioning funding plan, or submit a certification that financial assurance for decommissioning has been provided. Certification amounts of $750,000, or $150,000, depending on the quantity of material the licensee is authorized to possess, are applicable to Part 30 licensees.

Part 30 licensees authorized to possess certain quantities of byproduct material in sealed sources or plated foils may either submit a decommissioning funding plan or submit a certification that financial assurance has been provided in the amount of $75,000.

B. 10 CFR Part 40

Section 40.36 requires a licensee authorized to possess large quantities of material to submit a decommissioning funding plan which includes a site-specific decommissioning cost estimate. Section 40.36 licensees authorized to possess lesser amounts of material, but above the threshold for financial assurance, may either submit a decommissioning funding plan, or submit a certification that financial assurance for decommissioning has been provided in the amount of $150,000.

C. 10 CFR Part 70

10 CFR Part 70 requires a uranium enrichment facility licensee, or a licensee authorized to possess large quantities (based on applicable quantities in Appendix B to Part 30) of unsealed special nuclear material having a half-life greater than 120 days to submit a decommissioning funding plan, which includes a site-specific decommissioning cost estimate.

Part 70 licensees, other than uranium enrichment facility licensees, authorized to possess lesser amounts of such special nuclear material, but above the threshold for financial assurance, may either submit a decommissioning funding plan, or submit a certification that financial assurance for decommissioning has been provided. Certification amounts of $750,000 or $150,000, depending on the quantity of material the licensee is authorized to possess, are applicable to Part 70 licensees.

III. Proposed Changes

The changes being proposed are in four areas: (1) Large sealed source licensees--large irradiators-- would no longer be able to use the $75,000 certification amount as a basis for financial assurance, and would have to base their financial assurance on a site-specific decommissioning cost estimate; (2) Waste broker licensees would be required to provide financial assurance and would not be permitted to use the certification amounts. They would have to base their financial assurance on a site-specific decommissioning cost estimate; (3) the certification amounts for all licensees would be increased by 50 percent; and (4) Licensees using a decommissioning cost estimate would have to update it at least every 3 years.

IV. Alternatives

The two alternatives considered here are (A) no action, and (B) carrying out the rulemaking described in this regulatory analysis.

(A) No Action

Under this alternative, no rulemaking would be done. The amount of financial assurance required would not be adequate to fully fund decommissioning activities for a large number of licensees. This gap in funding would increase the likelihood that decommissioning of some facilities would not be carried out in a timely manner. This could result in adverse health and safety effects, and could also have adverse environmental effects. It would also increase the likelihood that State or local governments and/or the general public would have to bear the costs of decommissioning.

No costs to licensees or NRC would be involved for this alternative. Licensees would not be subject to any cost increases, and NRC would not incur costs associated with developing and implementing the rulemaking.

(B) Rulemaking to Revise the Financial Assurance Requirements for Materials Licensees

Under this alternative, large irradiator and waste broker licensees would have to base financial assurance on a site-specific decommissioning cost estimate. All waste brokers would have to provide financial assurance. The certification amounts would be raised by 50%, providing approximately $80 million in additional financial assurance[1]. Decommissioning cost estimates would have to be updated at least every 3 years. A rulemaking to revise the financial assurance requirements for materials licensees would increase the assurance of adequate funding for decommissioning activities. This increased assurance would make timely decommissioning more likely, contributing to maintaining public health and safety and protection of the environment. This action would also decrease the likelihood that State and local governments and/or the general public would have to bear the costs of decommissioning.

The benefit of the planned rulemaking is the continuation of assurance of adequate funding for timely decommissioning. As stated above, there are gaps in the current financial assurance regulations, mainly due to large increases in decommissioning costs since the financial assurance regulations were put in place. Allowing these gaps to remain could increase the likelihood of inadequate funding for timely decommissioning.

[1] Staff estimate based on current numbers of licensees using each certification amount.

The effect of inadequate/untimely funding of decommissioning may have adverse impacts on public health and safety. If a site is not decommissioned due to insufficient funds there is an increased likelihood of contamination and/or exposure of members of the public. The changes to the regulations proposed are concentrated in areas where the likelihood of inadequate funding relative to decommissioning costs appear to be relatively high. First, the financial assurance requirements are imposed only on those licensees having the highest possession limits, and thus the potential for highest doses. Only about 10 percent of materials licensees must provide financial assurance. Second, the changes proposed in this plan address situations where risk of inadequate funding of decommissioning obligations is greatest -- where required amounts of financial assurance appear to be substantially less than decommissioning costs.

Failure to provide adequate financial assurance for decommissioning also has equity considerations. The potential public costs involved in cleanup of contaminated facilities where financial assurance is inadequate must be considered. Equity considerations call for adequate financial assurance so that a licensee's decommissioning costs are borne by the licensee.

Large Irradiators

Large irradiator licensees are licensees that are engaged in the irradiation of food products and medical equipment. These large irradiators operate facilities that have a large number of sealed sources, with possession limits ranging up to several million curies. The NRC has approximately 10 large irradiator licensees (licensees authorized for 1million curies or more). Estimated decommissioning costs for an irradiator facility with 1 million curies of source activity are at least $128K; for a facility with 2 million curies, estimated costs are at least $231K. These cost estimates are for the least costly decommissioning scenarios, with all sources being returned to the supplier and no leakage contamination[2].

Revision of the possession limits under which a sealed source licensee may use the $75K certification amount would make large irradiator licensees base financial assurance on the

[2]Technology, Safety, and Costs of Decommissioning a Reference Large Irradiator and Reference Sealed Sources, NUREG/CR-6820, Pacific Northwest National Laboratory, 1996.

alternative of a site-specific decommissioning cost estimate. This facility-specific cost estimate is likely to be higher than $75K, and the licensee would incur higher financial assurance costs. The NRC believes that the increased financial burden on licensees is necessary to provide an adequate amount of financial assurance. The facility-specific cost estimate should provide a more accurate estimate of decommissioning costs, but would involve more effort on the part of licensees to prepare such an estimate.

Cost impacts on licensees would consist of: (1) the cost of preparing a decommissioning cost estimate; and (2) the cost of additional financial assurance required if the decommissioning cost estimate were above the applicable certification amount that could formerly be used.

The cost of preparing a site-specific decommissioning cost estimate could vary considerably depending on type of operations conducted by the licensee. It should be noted that a decommissioning cost estimate is only a part of an overall decommissioning plan. An actual database on costs is lacking. For the purposes of this regulatory analysis, a potential range of costs is given, based on a lower assumption of 2 professional staff weeks of effort to prepare a decommissioning cost estimate, and a higher assumption of 4 professional staff weeks of effort. Labor rate assumed is $77 per staff hour.

Large Irradiators
Estimated Cost of Preparing Decommissioning Cost Estimate
10 licensees

	Cost per Licensee	Total Costs All Licensees
Lower	$6,200	$62,000
Higher	$12,400	$124,000

The higher cost estimate per licensee would represent approximately 5% of a total decommissioning cost of $250K, which seems a reasonable percentage. However, NRC welcomes comments on these estimates.

Cost impacts from the additional amount of financial assurance required if based on a decommissioning cost estimate are estimated using the $75K certification amount currently used by these licensees as a baseline. The estimated cost of basing financial assurance on a decommissioning cost estimate is taken from the decommissioning cost estimates for large irradiators in NUREG/CR-6280. For a large irradiator, NUREG/CR-6280 gives estimated decommissioning costs of $231K for the most likely decommissioning option. The additional financial assurance required by the change would be $231K less $75K, or $156K per licensee. Financial assurance instruments, such as letters of credit and surety bonds, typically cost approximately 1.5% of the amount of financial assurance covered per year. Added costs per licensee would thus be $2.3K per year. Total added costs for all 10 licensees would be $23K per year.

3) Waste Broker Licensees

Waste broker licensees are those licensees that handle radioactive waste associated with or generated under other licenses. There is no definition of "waste broker" in existing NRC regulations and the term is commonly used to describe several different activities. However, NRC practice has been that waste broker refers to any licensee that engages in the following activities: waste collection and consolidation; waste storage; waste processing, repackaging, or other treatment (e.g., decay in storage, compaction); or transfer to another waste broker or to a licensed low-level radioactive waste land disposal facility. The NRC has approximately 15 waste broker licensees, of which 8 require financial assurance[3]. Many waste broker licensees also conduct other types of licensed activities as part of their overall business. The NRC financial assurance regulations treat waste brokers in the same way as other materials licensees; there are no special financial assurance requirements applicable only to waste brokers.

From the viewpoint of financial assurance, waste broker activities are unique in that: (1) waste brokers are likely to have radioactive wastes generated by other licensees, and the inventory of waste a broker will have on site at any time may fluctuate considerably and be

[3] "Assessment of the Financial Assurance Requirements for Waste Broker Material Licensees", ICF Consulting, 1999, p. 6.

difficult to predict, decommissioning options are mainly limited to waste disposal; and (2) waste brokers have a financial interest in maximizing the amount of radioactive waste that they handle -- waste broker revenues are directly correlated to the amount of waste accepted.

The disposal costs of waste inventories are very high - much greater than when the decommissioning regulations were promulgated. The cost of disposal of 100 drums of waste is estimated to be approximately $300K to $400K[4]. The current financial assurance regulations do not consider the costs of disposing of significant volumes of waste generated outside the decommissioning process, such as inventories of brokered waste. Waste brokers currently may maintain a level of financial assurance which is inadequate for disposal of waste inventories. Charges for disposal of waste at low-level waste disposal facilities are based on the volume of waste disposed, and also on level of activity and characteristics of the waste. The possession limits that determine what level of financial assurance a waste broker licensee must have are based on the quantity of curies of material possessed, not volume of material possessed. A waste broker that must dispose of large volumes of relatively low activity waste would be subject to substantial waste disposal charges. However, that same waste broker might be required to have an inadequate amount of financial assurance to pay these charges because the financial assurance requirements are based only on curie level.

Cost impacts on licensees would consist of: (1) the cost of preparing a decommissioning cost estimate; (2) the cost of providing financial assurance for licensees not now required to do so; and (3) the cost of additional financial assurance required if the decommissioning cost estimate were above the applicable certification amount that could formerly be used.

The cost of preparing a site-specific decommissioning cost estimate could vary considerably depending on type of operations conducted by the licensee. An actual database on costs is lacking. For the purposes of this regulatory analysis, a potential range of costs is given, based on a lower assumption of 2 professional staff weeks of effort to prepare a decommissioning cost estimate, and a higher assumption of 4 professional staff weeks of effort.

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[4] "Assessment of the Financial Assurance Requirements for Waste Broker Material Licensees", ICF Consulting, 1999, p. 3.

NRC has 3 waste broker licensees that use the certification amount and 7 that do not now require financial assurance so that a total of 10 additional licensees would have to prepare a decommissioning cost estimate.

Waste Brokers
Estimated Cost of Preparing Decommissioning Cost Estimate
10 waste broker licensees

	Cost per Licensee	Total Costs All Licensees
Lower	$6,200	$62,000
Higher	$12,400	$124,000

Most waste brokers are organizations primarily engaged in other activities. What part of the organization's decommissioning costs, and its current financial assurance requirements, are attributable to its waste broker activities is not known. This makes estimates of decommissioning costs for a "typical" waste broker difficult. These licensees would face larger financial assurance requirements if this proposed rule became final, but an estimate of added costs cannot be made.

Certification Amounts

The amount of financial assurance which must be provided can be based on either: (1) a facility-specific decommissioning cost estimate provided by the licensee in a decommissioning funding plan[5]; or (2) one of several dollar amounts (certification amounts) specified in the regulations at 10 CFR 30.35. The certification amounts are based on possession limits, and range from $75,000 for sealed source licensees to $750,000 for licensees possessing large quantities of unsealed material. At present, about 60% of materials licensees required to have

[5]For some types of licensees using very large amounts of unsealed radioactive material, a facility specific cost estimate must be used.

financial assurance use the certification amounts. Which certification amount is required of a licensee depends on the possession limits for radioactive materials applicable to that license.

The present certification amounts are based on decommissioning cost estimates that are now approximately 15 years old. When the decommissioning rule was established, it was expected that periodic adjustments to the certification amounts would be needed as decommissioning costs changed over time. General inflation since 1988, as measured by the Gross Domestic Product price deflator, has resulted in current prices that are approximately 40 percent higher than they were when the final decommissioning rule was published. Specific information on decommissioning costs also show a substantial increase[6]. NRC has reviewed the current decommissioning cost information[7], and is proposing adjustments to the certification amounts. The revisions to the certification amounts proposed in this notice are aimed at keeping the certification amounts reasonably in accordance with current decommissioning costs for a typical licensee that has possession limits that allow it to use that particular certification amount.

Approximately 300 NRC materials licensees required to have financial assurance use the certification amounts rather than a facility-specific decommissioning funding plan. These licensees would face increased costs of obtaining financial assurance if an increase in certification amounts resulted from this proposed rulemaking. All licensees using the certification amounts would continue to have the option of submitting a facility-specific decommissioning funding plan. If a licensee believed that the certification amounts were excessive for its decommissioning obligations, it could use the alternative of a facility-specific decommissioning funding plan.

An estimate of costs to licensees of increasing the certification amounts by 50% can be made assuming the number of licensees using certification amounts does not change, and

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[6]Revised Analysis of Decommissioning Reference Non-Fuel Cycle Facilities, draft NUREG/CR-6477, Pacific Northwest National Laboratories, 1998.

[7]2. " Analysis of Decommissioning Certification Amounts for Materials Licensees (Parts 30, 40, and 70)", ICF Consulting, 2000.

annual costs of financial assurance are 1.5% of the amount of financial assurance provided. Per licensee annual costs of providing the additional financial assurance would range from a low of $0.6K per year for licensees using the $75K amount to a high of $5.6K per year for licensees using the $750K amount. Total estimated additional annual financial assurance costs for all of the 300 licensees are $1,175K.

The estimated cost impacts presented here can be regarded as upper limits. Actual total cost impacts on licensees using the certification amounts can be expected to be less than these estimates, for several reasons: (1) a licensee facing an increased certification amount may decide to stop using the certification amounts as a basis for financial assurance, and instead, base financial assurance on a decommissioning funding plan. This would be expected if a licensee's actual decommissioning cost estimates were lower than the applicable certification amount; and (2) approximately 30% of licensees using the certification amounts can use virtually costless financial assurance mechanisms, such as statements of intent, and parent guarantees or self guarantees. A government licensee, such as a Federal military facility or certain State universities, can use a statement of intent -- a commitment by a government agency that it will seek appropriations for decommissioning. Some qualifying private licensees can use a self guarantee or a parent company guarantee, which also do not involve any direct expense for the licensee.

Requirement for Updating Decommissioning Cost Estimates

The proposed rule contains a requirement that decommissioning cost estimates be updated at least every three years. Current requirements call for updating periodically, but do not specify a time limit. NRC guidance calls for updating every 5 years. Approximately 210 licensees would be affected. Based on a staff estimate of 15 hours needed for each update at $77 per hour, cost per licensee for each update is $1,155. If updating were done every 5 years, on an annual basis cost per licensee would be $231 -- every 3 years it would be $385. The additional annual cost to each licensee of increasing the frequency of updating from every 5 to every 3 years would be approximately $150. Total additional costs for all 210 licensees of imposing a 3 year updating requirement would be approximately $32K per year.

Summary of Cost Impacts on Licensees

Cost impacts are of 2 types, one-time costs, such as preparing an initial decommissioning cost estimate, or recurring costs, such as for financial assurance, or updating a decommissioning cost estimate. Total estimated additional costs for all of the affected licensees are: (1) one-time costs of $124K-$248K for preparing initial decommissioning cost estimates; (2) recurring annual costs of providing additional financial assurance -- $1,198K; and (3) recurring costs of updating the decommissioning cost estimate -- $32K on an annual basis. The major cost impact is the approximately $1.2 million annual cost of providing the additional approximately $80 million in financial assurance required by raising the certification amounts.

D. Resource Cost to NRC of Planned Rulemaking

NRC costs are the immediate costs of developing a rulemaking, and any subsequent implementation costs. NRC estimates that this proposed rulemaking, if finalized, would require 2.4 full time equivalent person-years. At present labor rates of $137K per year, this amounts to $329K. In addition, direct contractor support for the rulemaking is estimated at $159K. The total direct cost of the rule is thus $488K. Some portion of the studies of decommissioning costs carried out by PNNL can also be considered an indirect cost (these reports are used for other purposes in addition to supporting a basis for this rulemaking).

Implementation costs would be the cost of revising guidance documents, principally the “NMSS Decommissioning Standard Review Plan”, NUREG-1727, and additional costs involved in reviewing a larger number of decommissioning funding plans. NRC would also need to review decommissioning cost updates on a more frequent basis. At $77 per hour, the estimated cost of these activities would be approximately $35K (460 staff hours) in one-time costs and $11K (140 staff hours) in annualized recurring costs.

Decision Rationale

As stated previously, the benefit of the planned rulemaking is the continuation of assurance of adequate funding for timely decommissioning. There are gaps in the current

financial assurance regulations that could increase the likelihood of inadequate funding for timely decommissioning. The effect of inadequate/untimely funding of decommissioning may have adverse impacts on public health and safety. If a site is not decommissioned due to insufficient funds there is an increased likelihood of contamination and/or exposure of members of the public. In addition, adequate financial assurance would prevent situations where Federal, State, or local governments would bear the cost of decommissioning, rather than site operators. This proposed action would provide an additional approximately $80 million in financial assurance coverage.

The total costs of this proposed action are one-time costs to licensees and NRC of approximately $650-$770K, and recurring annual costs of approximately $1,240K. These costs appear reasonable to achieve the objectives stated above.

Impacts on Agreement States and Agreement State Licensees

The sections of 10 CFR Parts 30, 40, and 70 dealing with financial assurance and their respective compatibility categories are as follows:

§30.35 Financial assurance and recordkeeping for decommissioning

Compatibility category D, except D/ Health and Safety - paragraphs (a), (b), (d), and (g).

States are given flexibility to allow different dollar amounts based upon jurisdiction and local conditions. The Health and Safety designation for paragraph (g) is warranted because of the requirement for transfer of certain records (e. g., spills or spread of contamination) important for decommissioning to a subsequent licensee at the same facility.

§40.36 Financial assurance and recordkeeping for decommissioning

Compatibility category D - paragraphs (c) and (e). Category D/Health and Safety - paragraphs (a), (b), (d), and (f).

States have the flexibility to specify different dollar amounts based on jurisdiction and local conditions. The Health and Safety designation for paragraph (f) is warranted because of the requirement for transfer of certain records (e. g., spills or spread of contamination) important for decommissioning to a subsequent licensee at the same facility.

§70.25 Financial assurance and recordkeeping for decommissioning

Compatibility category D except (a) is NRC, and D/Health and Safety - paragraphs (b), (d), and (g).

States have the flexibility to specify different dollar amounts based on jurisdiction and local conditions. Paragraph (a) addresses areas reserved to the NRC because it concerns uranium enrichment facilities and special nuclear materials in quantities sufficient to form a critical mass.

The compatibility categories of the financial assurance regulations are not being changed in the proposed rulemaking.

Certain materials licensees in Agreement States would have increased costs of providing financial assurance if this proposed rule becomes final. An estimate of the cost impacts on Agreement State licensees cannot be made here due to the limitations of data and this analysis. However, some idea of the extent of potential impacts on Agreement State licensees could be inferred from the relative numbers of NRC and Agreement State licensees. The NRC has approximately 4900 materials licensees, while Agreement States have approximately 16,000.

Implementation

NRC's schedule for completion of this rulemaking calls for a final rule to be published in 2003.

Applicable guidance material, the "NMSS Decommissioning Standard Review Plan", NUREG-1727, would be revised as part of the next general revision of this document.

Implications for Other Federal Agencies

Promulgation of this rule would have no adverse effects on other Federal agencies. If financial assurance enhancements prevented future situations where inadequate decommissioning funding resulted in sites being added to the Environmental Protection Agency's Superfund list, EPA's obligations would be reduced.

References

1. Technology, Safety, and Costs of Decommissioning a Reference Large Irradiator and Reference Sealed Sources, NUREG/CR-6820, Pacific Northwest National Laboratory, 1996.

2. "Analysis of Decommissioning Certification Amounts for Materials Licensees (Parts 30, 40, and 70)", ICF Consulting, 2000.

3. "Assessment of the Financial Assurance Requirements for Waste Broker Material Licensees", ICF Consulting, 1999.

4. Revised Analysis of Decommissioning Reference Non-Fuel Cycle Facilities, draft NUREG/CR-6477, Pacific Northwest National Laboratories, 1998.