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RULEMAKING ISSUE

(NEGATIVE CONSENT)

December 17, 1996

SECY-96-256

FOR: The Commissioners

FROM: James M. Taylor
Executive Director for Operations

SUBJECT: CHANGES TO THE FINANCIAL PROTECTION REQUIREMENTS FOR PERMANENTLY
SHUTDOWN NUCLEAR POWER REACTORS, 10 CFR 50.54(W) AND 10 CFR 140.11

PURPOSE:

To inform the Commission of the staff's rulemaking plan for amending financial protection requirements for permanently shutdown (PSD) nuclear power reactors.

BACKGROUND:

In an SRM dated July 13, 1993, the Commission approved staff recommendations to: (1) allow licensees that have permanently shut down to withdraw from the secondary financial protection layer under the Price Anderson Act (section 170 of the Atomic Energy Act, as amended), (2) reduce the required primary financial protection coverage under Price Anderson to \$100 million after an appropriate spent fuel cooling period, and (3) proceed with rulemaking to determine appropriate further reductions in the level of insurance coverage after the appropriate spent fuel cooling period. The Commission also requested that the staff determine whether there is a need for financial protection for ISFSIs and requested clarification of the term "rated capacity," as applied to permanently shutdown reactors. This rulemaking plan responds to item 3 in the SRM for PSD plants. The staff will address the financial protection requirements for ISFSIs after current efforts dealing with technical and licensing issues for ISFSIs are resolved in the areas of safeguard requirements, emergency planning, and potential fuel storage handling activities. The results of these efforts will provide the staff with information for evaluating the need for financial protection requirements. Items 1 and 2 of the SRM were addressed previously in a memorandum dated August 4, 1993 from the EDO to the Commission.

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NOTE: TO BE MADE PUBLICLY AVAILABLE
WHEN THE FINAL SRM IS MADE AVAILABLE

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L-4-1, PT 140
X OFM-6 comm
r-L-4-1, PT 50
SHUTDOWN
+ LOW POWER

SECY

The staff has determined that there is a need to modify existing regulations for insurance coverage and financial protection requirements in 10 CFR 50.54(w) and 10 CFR 140.11 because of reduced risk associated with permanently shutdown reactors. The staff proposes to allow licensees to reduce the level of liability coverage based on several different reactor configurations that are anticipated following permanent shutdown.

DISCUSSION:

The staff has made an evaluation of the radiological and economic consequences that may occur during various post shutdown scenarios. The staff recommends specified levels of liability coverage that should be required of the licensees that meet specified reactor configurations during permanent shutdown. This would allow nuclear reactor licensees a reduction in onsite and offsite liability coverage during permanent shutdown without resorting to the exemption process.

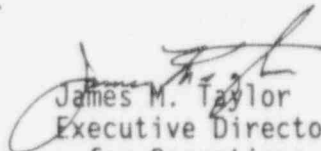
Specifically, the staff plans to amend 10 CFR 50.54(w) to allow nuclear reactor licensees to lower the onsite insurance requirements based on several different configurations that encompass spent fuel characteristics and storage modes following permanent shutdown. In parallel, offsite financial protection requirements as specified in 10 CFR 140.11 would also be adjusted to allow licensees to lower their primary insurance coverage and be able to withdraw from the industry retrospective rating plan based on satisfying the requirements as specified for the several different configurations during permanent shutdown. In addition, the proposed offsite insurance requirements would continue to provide protection to the Federal government from indemnity claims even though the NRC staff considers that such events would be rare and would have negligible offsite consequences.

COORDINATION:

The Office of the General Counsel has no legal objection to the Rulemaking Plan.

RECOMMENDATION:

I intend to proceed with the development of the rule as described in the attached Rulemaking Plan unless otherwise directed by the Commission within 10 days from the date of this paper.


James M. Taylor
Executive Director
for Operations

Attachment: As stated

DISTRIBUTION:

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11/17 SECY NOTE: In the absence of instructions to the contrary, SECY will notify the staff on Monday, Friday, January 6, 1997 that the Commission, by negative consent, assents to the action proposed in this paper.

RULEMAKING PLAN

AMENDING FINANCIAL PROTECTION REQUIREMENTS FOR
PERMANENTLY SHUTDOWN NUCLEAR POWER REACTORS
AND INDEPENDENT SPENT FUEL STORAGE FACILITIES

Lead Office: Office of Nuclear Regulatory Research

Staff Contact: George Mencinsky, RDB

Concurrences:

Bill Morrison *12/6/96*
D. Morrison, RES Date

Concurrence on *11/27/96* *per Richard Dudley*
F. Miraglia, NRR Date

Requested Removal for Concurrence *4/27/96* *per J. Gray*
J. Lieberman, OE Date

Concurrence on *11/6/96* *per S. Lewis*
W. Olmstead, OGC Date

Concurrence on *11/6/96* *per A. Persinger*
C. Paperiello, NMSS Date

Approval:

J. Taylor *12/17/96*
J. Taylor, EDO Date

RULEMAKING PLAN FOR AMENDING FINANCIAL PROTECTION REQUIREMENTS FOR PERMANENTLY SHUTDOWN NUCLEAR POWER REACTORS

ISSUES TO BE RESOLVED

The current insurance coverage regulations for nuclear power reactors do not take into consideration the reduced risk associated with permanently shutdown (PSD) plants. Reduced insurance coverage for these plants has been allowed through the exemption process.

Consideration of whether financial protection coverage should be reduced for PSD plants needs to take into account the preservation of the solvency of the organization responsible for maintaining and decommissioning these facilities in the unlikely event of a nuclear incident. Timely payment for valid damage claims by members of the public and minimization of the likelihood that Federal government indemnity would be called upon for satisfaction of claims for damages would have to be considered.

In addition, the existing requirements for offsite financial protection apply to power reactors with a specified "rated capacity" in terms of electrical kilowatts. The use of the term "rated capacity" needs to be modified to address indemnity for permanently shutdown plants.

CURRENT RULE REQUIREMENTS

Licensees of facilities designed to produce substantial amounts of electricity, a rated capacity of 100,000 kWe or more, must have and maintain, according to 10 CFR 140.11, a primary insurance coverage of \$200 million from private sources to protect against offsite liability. In addition, licensees must maintain secondary financial protection in the form of private liability insurance available under an industry retrospective rating plan. The current maximum obligation for secondary financial protection for a licensee in this plan is \$75.5 million with respect to any nuclear incident. Thus, the total financial protection for offsite liability for any incident would be the primary layer of \$200 million, plus the secondary layer of \$75.5 million multiplied by the number of licensed power reactors with a rated capacity of 100,000 kWe or higher.

Under 10 CFR 50.54(w), power reactor licensees must obtain insurance coverage from private sources to provide protection against onsite damage in the event of an accident. These monies would allow the licensee to stabilize and decontaminate the reactor and reactor station site in the event of an accident. The minimum amount of insurance coverage is the lesser of either \$1.06 billion or whatever amount of insurance is generally available from private sources.

BACKGROUND

This rulemaking plan is part of a broad effort to eliminate unnecessary regulatory burdens for power reactor facilities that are permanently shutdown and in the process of decommissioning. This plan complements other amendments

for decommissioning, such as the final rule that was published in the Federal Register (61 FR 39278) on July 29, 1996, that clarified the procedures that lead to permanent shutdown and eventually to the termination of an operating license for nuclear power reactors. Under that rule, permanent shutdown would become a codified status of a reactor when a licensee has certified that all fuel has been removed from the reactor core and that it has permanently ceased power operations.

In an SRM¹ dated July 13, 1993, the Commission approved staff recommendations to: (1) allow licensees that have permanently shut down to withdraw from the secondary financial protection layer under the Price Anderson Act (section 170 of the Atomic Energy Act, as amended), (2) reduce the required primary financial protection coverage under Price Anderson to \$100 million after an appropriate spent fuel cooling period, and (3) proceed with rulemaking to determine appropriate further reductions in the level of insurance coverage after the appropriate spent fuel cooling period. The Commission also requested that the staff determine whether there is a need for financial protection for ISFSIs and requested clarification of the term "rated capacity," as applied to permanently shutdown reactors.

This rulemaking plan responds to above item 3 in the SRM for PSD plants. The staff will address the financial protection requirements for ISFSIs after current efforts dealing with technical and licensing issues for ISFSIs are resolved in the areas of safeguard requirements, emergency planning, and potential fuel storage handling activities. The results of these efforts will provide the staff with information for evaluating the need for financial protection requirements. Items 1 and 2 of the SRM were addressed previously in a memorandum dated August 4, 1993, from the EDO to the Commission. This rulemaking will also address a petition submitted by the North Carolina Public Staff Utilities Commission. The petition, PRM-50-57, requested reduction or, preferably, elimination of the \$1.06 billion of insurance for onsite reactor stabilization and accident decontamination that is required by 10 CFR 50.54(w) in instances when all nuclear fuel has been removed from the site. The petitioner also requested that the requirement for offsite primary and secondary liability coverages required under 10 CFR 140.11(a)(4) be reduced or, preferably, eliminated for shutdown reactors when no nuclear fuel is on the reactor site.

DISCUSSION

For the purpose of discussion, several different configurations for permanently shutdown reactors have been established that encompass anticipated spent fuel characteristics and storage modes following permanent shutdown. They are as follows:

Reactor Configuration 1: Reactor is defueled, permanently shutdown, and spent fuel in the spent fuel pool is susceptible to a zircaloy cladding fire if the spent fuel pool is drained accidentally. This configuration

¹SRM dated July 13, 1993, "SECY-93-127, Financial Protection Required of Licensees of Large Nuclear Power Plants During Decommissioning."

encompasses the period commencing immediately after the offload of the core to just prior to when the decay heat of the hottest assemblies is low enough that no rapid zircaloy oxidation will take place and the fuel cladding will remain intact, such as no gap release, in the event of loss of water in the spent fuel pool.

Reactor Configuration 2: Reactor is defueled, permanently shutdown, and spent fuel is in the spent fuel pool but is not susceptible to a zircaloy cladding fire or gap release caused by an incipient fuel cladding failure in the event the spent fuel pool is drained accidentally. In this configuration, the spent fuel can be stored on a long-term basis in the spent fuel pool without the possibility of initiating a zircaloy fire or significant fuel cladding failure. In addition, the site may contain a radioactive inventory of liquid radwaste, activated reactor components, and contaminated structural materials. The radioactive inventory during this configuration may change depending on the licensee's proposed shutdown activities and schedule.

Reactor Configuration 3: Reactor is permanently shutdown and no spent fuel is in the reactor or the spent fuel pool. All spent fuel has been removed to an offsite or onsite dry storage ISFSI or to a DOE high-level repository. The remaining radioactive inventory depends on the decommissioning status and will include liquid radwaste, activated reactor components, and contaminated structural materials.

Reactor Configuration 4: Same as reactor configuration 3, except the reactor site has no significant amount of mobile sources of radioactivity such as contaminated liquids (less than 1000 gallons).

There are potential onsite and offsite radiological consequences that could be associated with the onsite storage of the spent fuel in the spent fuel pool for some time after permanent shutdown. In reactor configuration 1, in the event of a complete loss of spent fuel pool coolant inventory such as from a beyond design basis earthquake scenario, there is a potential for overheating of the fuel by decay heat. This sequence could result in a zircaloy cladding fire that could have significant onsite and offsite consequences. The probability of a zircaloy cladding fire, resulting from the loss of water from the spent fuel pool, is estimated to have a mean value of 2×10^{-6} per reactor year.²

The information in NUREG-1353, "Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools," indicated that a potential hazard associated with spent fuel storage would remain for some time after a reactor has been shutdown. Once the requisite cooling period for the spent fuel had elapsed after reactor shutdown, the potential zircaloy cladding fire sequence would no longer be a concern since air would cool the spent fuel sufficiently to avoid zircaloy cladding

²NUREG-1353, "Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools," April 1989.

combustion.

A recent analysis by Brookhaven National Laboratory (BNL) estimates that, in order to prevent fuel rod cladding failure leading to a zircaloy cladding fire given the loss of all spent fuel pool water, the rod cladding temperature must not exceed 565°C. This cladding temperature would be reached for reactor configuration 1 after a decay period of approximately 7 months for BWRs and 17 months for PWRs.³ These time estimates were based on a set of conservative assumptions such as high density fuel racking geometries, high burnup fuel, 60,000 MWD/MTU for PWRs and 40,000 MWD/MTU for BWRs, and postulated incipient spent fuel clad failure at 565°C. The time periods for spent fuel cooldown and rod cladding temperature are important factors in the consideration of modifying the financial protection requirements for permanently shutdown reactors. For reactor configuration 1, the possible radiological consequences as analyzed by BNL could, in certain cases, approach those of a severe core damage accident which might occur during plant operation.³

For reactor configuration 2, the spent fuel has decay heat sufficiently low that the cladding will remain intact even if all spent fuel pool water is lost. The postulated accident scenario for this configuration is assumed to be a single assembly dropped in the spent fuel pool, resulting in damage to 100 percent of the rods in the affected assembly. The onsite cleanup costs are estimated from \$9 to 24 million, and there are negligible offsite costs associated with this postulated event.^{3,4,5} This would be the controlling accident scenario in reactor configuration 2 if the radioactive inventory onsite was negligible. It may be plausible that the licensee would take this course of action during reactor configuration 2 to reduce the radioactive inventory onsite in order to take advantage of offsite disposal costs early in the decommissioning process. However, if there are significant sources of radioactive material stored onsite, then it would be appropriate to have a higher level of onsite insurance coverage than the estimated \$9 to \$24 million. Previous analyses have shown that radiological and nonradiological safety impacts from normal decommissioning operations and potential accidents are extremely small.^{6,7} Taking the conservative approach, a scenario of the rupture of a large slightly contaminated liquid storage tank, discussed as

³NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants," U.S. Nuclear Regulatory Commission Report by Brookhaven National Laboratory (to be published in 1996).

⁴BNL Technical Letter Report dated 12/29/95, "Task 2 - Permanent Shutdown Program: Transmittal of Onsite Property Damage Insurance Recommendations."

⁵BNL Technical Letter Report dated 1/22/96, "Task 2 - Permanent Shutdown Program: Transmittal of Offsite Liability Insurance Recommendations."

⁶NUGEG/CR-0130, "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," June 1978.

⁷NUREG/CR-0672, "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," June 1980.

part of reactor configuration 3, was selected as conceivable also under reactor configuration 2. That postulated event was estimated to result in an onsite waste cleanup cost of approximately \$50 million with negligible radiological consequences offsite. In economic terms, it surpassed the cleanup costs associated with a fuel handling accident discussed above and it has been taken into account in determining the upper bound level of onsite insurance coverage required in reactor configuration 2. A similar event to the rupture of the large slightly contaminated liquid storage tank would be an accidental release of the large volume of water from the spent fuel pool. This event would have similar cleanup costs as associated with the rupture of the large slightly contaminated liquid storage tank.

Even though the offsite consequences are negligible in reactor configuration 2 for the events cited above, because the spent fuel pool is operational and an inventory of radioactive materials exists onsite an appropriate level of offsite financial protection is required to account for the potential for significant judgements or settlements from litigation that might be instituted and to protect the Federal government from indemnity claims.

For reactor configuration 3, when spent fuel is no longer stored in the spent fuel pool, the potential for a radiological incident is primarily focused on mobile sources of radioactivity onsite at permanently shutdown nuclear reactors. For estimating accident cleanup costs, the limiting event considered is the rupture of a borated water storage tank, releasing 450,000 gallons of slightly radioactive water that causes soil contamination and potential contamination of the groundwater table. The onsite cleanup costs are estimated at approximately \$50 million.⁴ Although not all reactor sites have a borated water storage tank, the rupture of other large tanks of slightly contaminated water could result in similar consequences.

The offsite cleanup costs were found to be negligible⁵ for reactor configuration 3 but as was noted in reactor configuration 2, an appropriate level of offsite financial protection is still required to account for the potential for significant judgements or settlements from litigation that might be instituted and also to protect the Federal government from indemnity claims. Because the level of risk has decreased from reactor configuration 2 by having no spent fuel in the spent fuel pool, the level of offsite financial protection required can be reduced by taking only into account the mobile radioactive inventory onsite.

For reactor configuration 4, it is postulated that, with no significant amount of mobile sources of radioactivity such as contaminated liquids onsite, and a fire protection program in effect, there is no event that would require maintaining the same level of insurance coverage for onsite or offsite financial protection as in reactor configuration 3. The basis for the transition from reactor configuration 3 to reactor configuration 4 is assumed to be the point at which there is less than 1000 gallons of liquid radwaste stored onsite. This number was chosen because it constitutes approximately a factor of 500 reduction in volume from the large volume tank used as the basis for the reactor configuration 3 limiting event. The postulated rupture of this much smaller tank is estimated to have at least 2 orders of magnitude less impact than the rupture of the large tank, such that onsite cleanup costs

would not necessitate a level of insurance coverage as specified in reactor configuration 3. Therefore, the coverage would be reduced further to account for the potential of onsite cleanup of an accidental rupture of a less than 1000 gallon tank during this period.

During reactor configuration 4, it may also be assumed that the licensee has cleaned the site to unrestricted release levels and is awaiting a confirmatory survey for termination of license. The level of onsite insurance coverage at this stage would be less than the scenario for the 1000 gallons of liquid radwaste stored onsite. Under these circumstances the onsite coverage could be further reduced to account for negligible onsite and offsite consequences. However, for offsite financial protection requirements, even though the offsite consequences are negligible, adequate coverage would still be required because of the litigious nature of our society.

PRELIMINARY REGULATORY ANALYSIS

Options

Based on the above, the following options were considered for power reactors that were permanently shutdown:

Issue A. Financial Protection Requirements For Reactor Configurations 1, 2, 3, & 4

1. No action. Maintain onsite insurance coverage requirements and offsite financial protection requirements for permanently shutdown nuclear reactors as prescribed by 10 CFR 50.54(w) and 10 CFR 140.11. Provide relief from regulatory requirements on a case-by-case basis through the exemption process.
2. Adjust onsite insurance coverage requirements and offsite financial protection requirements on a generic basis for permanently shutdown reactors based on limiting the spent fuel cladding temperatures for accidents involving loss of spent fuel pool water, the possibility of onsite dry storage of spent fuel, and the amount of liquid radwaste stored onsite in post shutdown modes. The insurance coverage requirements are based on the estimated cost of recovery from limiting hypothetical events for reactor configurations described below and due to intangible elements related to the assumption that claims by members of the public might be filed for offsite consequences from nuclear energy hazards. TMI-2 has shown that significant amounts can be involved (settlements in the TMI case) even though the offsite consequences were negligible.

Clarify the definition as stated in section 170(a) of the Atomic Energy Act of "facilities designed for producing substantial amounts of electricity and having a rated capacity of 100,000 electrical kilowatts or more" in 10 CFR 50.2 and 10 CFR 140.3 to indicate that a permanently shutdown nuclear reactor has a "rated capacity" of zero.

The following financial protection requirement would be specified:

Reactor Configuration 1 - fuel in spent fuel pool not sufficiently cool.

- Onsite insurance coverage requirements and offsite financial protection requirements remain as presently specified in 10 CFR 50.54(w) and 10 CFR 140.11, respectively.

Reactor Configuration 2 - fuel could tolerate a complete loss of water in the spent fuel pool.

- Onsite insurance coverage requirements - \$50 million. The amount of \$50 million to account for a rupture of a large slightly contaminated liquid storage tank, or recover from a postulated accident in the spent fuel pool.
- Offsite financial protection requirements - \$100 million based on the potential for significant judgements or settlements resulting from litigation despite negligible offsite consequences.

Reactor Configuration 3 - no fuel in spent fuel pool, risk dependent on radioactive inventory at plant site in decommissioning status.

- Onsite insurance coverage requirements - \$50/\$25 million. The amount of \$50 million based on the estimated amount to recover from a postulated onsite event of a rupture of a large slightly contaminated liquid storage tank. If the onsite radioactive liquid inventory is less than 1000 gallons, the insurance amount will be \$25 million.
- Offsite financial protection requirements - \$50 million based on the potential for significant judgements or settlements resulting from litigation that might still be instituted, but where the liability risk is considered less than in reactor configuration 2, despite negligible offsite consequences.

Reactor Configuration 4 - no fuel in the spent fuel pool and no significant source of mobile radioactive material.

- Onsite insurance coverage requirements - \$25/\$0 million. The amount of \$25 million based on the possibility of having to cleanup onsite contamination from an accidental rupture of a less than 1000 gallon contaminated liquid storage tank during shutdown activities. Elimination of onsite insurance coverage when licensee is awaiting confirmatory survey for license termination.
- Offsite financial protection requirements - \$25 million based on the potential for claims based upon asserted offsite consequences. This would minimize the possibility that the Federal government indemnification would be required. It should also be noted that the Atomic Energy Act does not allow a 10 CFR Part 50 licensee to entirely drop this coverage, only to reduce it.

3. Same as option 2 but would allow licensees to reduce further their offsite financial protection requirements during permanent shutdown without resorting to the exemption process. This option sets a *de minimis* level of liability insurance for offsite coverage on the order of \$5-10 million for reactor configurations 2, 3, and 4, consistent with the analyses that offsite radiological consequences are negligible and it would provide the Federal government with a minimal threshold of protection to financial risk from public indemnity claims. This alternative essentially endorses eliminating offsite financial protection requirements for permanently shutdown reactors in reactor configurations 2, 3, and 4, but maintains some required coverage to satisfy the legal requirements of the Price Anderson Act, which requires some level of public liability protection in effect.

Decision Criteria

Financial Protection Requirements for Permanently Shutdown Reactors (Reactor Configurations 1, 2, 3, and 4)

Option 1: The no action option retains the same financial protection requirements regardless of whether the power reactor is permanently shutdown or operating. Power reactor licensees would continue to be required to maintain coverage at the prescribed levels specified in the regulations during permanent shutdown. For each power reactor, that would amount to \$1.06 billion of onsite insurance coverage and primary offsite liability coverage of \$200 million plus \$75.5 million in secondary financial liability. In certain permanently shutdown scenarios, the above amount of financial coverage required of licensees would be more than necessary and costly based on analyses performed for the staff and the level of perceived risk during permanent shutdown.^{3,4,5} Power reactor licensees would have the opportunity to request an exemption from the above requirements. A number of licensees have used this process to obtain regulatory relief (Table 1). While exemptions could continue to provide regulatory relief, Option 1 would do so with far less regulatory certainty than Option 2 discussed below. Further, it poses a potential for inconsistencies among licensees, and would result in higher costs to both the licensee population and the NRC because of the cost inefficiencies of dealing with this issue on an individual plant basis.

Option 2: This option allows power reactor licensees to reduce their onsite insurance coverage and offsite financial protection requirements during permanent shutdown without resorting to the exemption process. The level of financial protection would be determined for permanently shutdown reactors at a level that coincides with their specified configuration stage.

During reactor configuration 1, licensees would be required to maintain onsite insurance coverage and offsite financial protection at the levels currently required by 10 CFR 50.54(w) and 10 CFR 140.11, respectively. This is because the radiological consequences during this stage of permanent shutdown approximate the magnitude of a severe core damage accident.³

After allowing the spent fuel to cool down and reach a point that the maximum

spent fuel cladding temperature will not exceed 565°C in the event of a loss of water in the spent fuel pool (reactor configuration 2), power reactor licensees would be allowed to reduce their onsite insurance coverage under 10 CFR 50.54(w) from \$1.06 billion to \$50 million. The reason for this reduction in insurance coverage is that the rapid clad oxidation event of reactor configuration 1 is not possible. Insurance coverage requirements for reactor configuration 2 are based on the fact that there is a possibility for a fuel handling accident in the spent fuel pool, and there are significant amounts of mobile radioactive sources onsite that have a potential for release during this period. The \$50 million coverage would be an adequate amount of insurance coverage to clean up the site in the event of a fuel handling accident, accidental release of cooling water from the spent fuel pool, or a rupture of a large slightly contaminated liquid storage tank.

The above proposed insurance coverage requirements for onsite coverage are higher than the amounts that were approved through the exemption process for Trojan and Yankee Rowe nuclear power plants (Table 1). Both plants received NRC approval to reduce onsite coverage to \$5 million. The exemption request was approved after the licensees provided site specific information as to the cleanup costs from hypothetical accident scenarios that might occur during permanent shutdown. The analyses took into account the passage of time to account for the radioactive inventory onsite from the date the units ceased operation in order to arrive at their cleanup cost estimates.

The proposed insurance coverage requirement for reactor configuration 2 does not take into account the reduction in radioactive decay of the spent fuel assemblies with the passage of time to proportion the insurance requirements during that period. The insurance coverage requirements are based on the conservative assumption of a fuel handling accident shortly after the transition to reactor configuration 2. Adjusting insurance requirements during reactor configuration 2 based on the decay level of the spent fuel would be burdensome from a regulatory standpoint as opposed to selecting a bounding figure to encompass any unexpected events concerning the spent fuel pool.

For reactor configuration 2, the offsite financial protection requirements set forth in 10 CFR 140.11 would be reduced from \$200 million to \$100 million for the primary liability coverage and the licensee would be allowed to withdraw from the secondary liability coverage under Price-Anderson for reactor configuration 2. Analyses have shown that the offsite impacts from limiting and conservative postulated accidents are negligible.^{3,4,5,6,7} However, it is reasonable to assume that there may still be lawsuits for alleged damages from offsite releases from a facility. TMI-2 has shown that significant settlements can be awarded, even though the BNL technical assessment reported negligible offsite consequences.³ Under this configuration, the staff estimates licensees may be able to reduce their insurance premiums from about \$750K/year to approximately \$350K/year.

For reactor configuration 3, when all the spent fuel has been removed to an onsite or offsite dry storage ISFSI or to a DOE high-level repository, and the onsite radioactive inventory is greater than 1000 gallons, the onsite insurance coverage requirements would be required at a level of \$50 million

under §50.54(w). This amount is based on the fact that there are still mobile radioactive sources onsite that have the potential to contaminate the site. Maximum cleanup costs associated with reactor configuration 3 are estimated at approximately \$50 million. The conservative limiting event is the rupture of a large contaminated liquid storage tank that causes soil contamination and potential contamination of the ground-water table. If the onsite radioactive liquid inventory is less than 1000 gallons, the insurance amount would be reduced to \$25 million to account for less impact to cleanup the site. The offsite financial protection requirements under section 140.11 would be reduced from \$100 million to \$50 million under reactor configuration 3. Some lawsuits should still be assumed even though the radiological consequences offsite are considered negligible, but the liability risk is considered less than under reactor configuration 2. With no spent fuel in the spent fuel pool, the risks of offsite contamination have been reduced considerably for this configuration. Under this configuration, licensees may be able to reduce their insurance premiums further to approximately \$250K/year.

For reactor configuration 4, there are no significant mobile sources of radioactivity such as liquid contaminants onsite. Thus, the potential for onsite and offsite radiological impacts is limited. Under this situation, onsite insurance coverage requirements would be either \$25 million or completely eliminated under section 50.54(w). The amount would be determined based upon information provided by a licensee and evaluated by the staff as to the particular circumstances of the shutdown reactor. The amount of \$25 million onsite insurance coverage requirements would be based on the amount of stored liquid radwaste onsite, usually 1000 gallons or less of radwaste, that may be susceptible to an accidental spill and cleanup of the contaminated site. The elimination of onsite insurance coverage requirements would be based on the condition that the site has been cleaned to unrestricted release levels and is awaiting a confirmatory survey for termination of license. In either case, the onsite and offsite consequences would be negligible.

In SECY-95-048, the staff recommended that there was no need to establish financial assurance for cleanup of accidents for material licensees. The recommendation to eliminate onsite insurance coverage for reactor configuration 4 in certain circumstances complements this action since imposition of financial assurance would be of no benefit to licensees, the NRC, or the public because the licensee would have adequate resources for cleanup. There would not be a public health or safety issue, and the Federal government would not incur a financial risk.

For reactor configuration 4, the offsite financial protection requirements would be reduced to \$25 million to account for the continuing potential for claims based upon asserted offsite consequences. Requiring a minimum of \$25 million in coverage would minimize the possibility that the Federal government indemnification would be required. It should also be noted that the Atomic Energy Act does not allow a 10 CFR Part 50 licensee to entirely drop this coverage, only to reduce it. Under this configuration, licensees may be able to reduce their insurance premiums below \$250K/year.

In addition, "rated capacity" would be clarified in 10 CFR Part 140 to indicate that permanently shutdown nuclear power plants have zero "rated capacity." Once the reactor entered into reactor configuration 2, it would no longer be subject to the requirements to maintain primary financial protection in the "maximum amount available at reasonable cost and on reasonable terms from private sources" and, further, to participate in a secondary financial protection public liability system under section 170 of the Atomic Energy Act. The Commission has already approved these adjustments in the primary and secondary public liability insurance regime and this clarification in Part 140, as requested by the Commission, places into the Commission's regulations a statement that a permanently shutdown nuclear power plant is no longer considered to have any "rated capacity."

Based on a preliminary cost benefit analysis, Option 2 will result in cost savings to the affected licensee population and the NRC because of the regulatory efficiencies associated with codifying the regulation. Option 2 will eliminate the need for most individual plant exemption requests thereby eliminating the development of exemption packages on behalf of licensees and their review and evaluation on behalf of the NRC. The staff's estimate of the savings per exemption request assumes a licensee's and NRC's level of effort of 4 person-weeks and 3 person-week, respectively. Based on labor rates of \$128/hour (1996 dollars) for both licensees and the NRC, each exemption request would cost a licensee and the NRC about \$20 thousand and \$15 thousand, respectively. Assuming that under Option 1, approximately 100 new exemption requests would be processed, suggests savings on the order of \$2.0 million to industry and \$1.5 million to the NRC. These savings would most likely be spread out over the next 20 to 30 years assuming license renewal is not widely implemented. In addition, Option 2 would result in greater regulatory certainty than Option 1, ensure consistent treatment among all power reactor licensees, and eliminate the potential for costly delays in effecting this appropriate regulatory relief.

Also, although an apparent strong economic incentive exists, there is no assurance or guarantee that all licensees would seek an exemption request if the no action option were retained. An exemption request is, after all, voluntary on industry's part and requires a licensee's initiation. To the extent certain licensees do not apply for exemptions, or delays occur in initiation, processing, or NRC approval, Option 2 would result in significant reductions in insurance premiums to the licensees relative to the no action alternative. Annual savings in insurance premiums per reactor are estimated to range from about \$400 thousand to \$750 thousand depending on the reactor configuration. If one assumed that 10 percent of the affected reactor population of 100 did not pursue an exemption under the no action alternative, industry-wide savings from Option 2 could eventually approximate \$4 million to \$7.5 million per year. Further, given the tendency on the part of industry to delay decommissioning, these annual savings could persist for decades as reactors remain in a permanently shutdown mode. Similarly, if the exemption process results in delays in regulatory relief, the annual per reactor savings of \$400 thousand to \$750 thousand would apply, prorated over the length of the delay.

Option 3: This option allows power reactor licensees to reduce further their

offsite financial protection requirements during permanent shutdown without resorting to the exemption process but would require onsite insurance coverage the same as in Option 2.

The Price Anderson Act requires that all Part 50 licensees have public liability financial protection coverage and that the Federal government assume responsibility for the liability claims that exceed that level of coverage. By reducing the offsite financial protection coverage under reactor configurations 2, 3, and 4 to the \$5-10 million range, a licensee's premiums would be reduced, although not necessarily linearly. Alternatively, on an expected value basis, Option 3 increases the likelihood that the Federal government would have to bear some of the financial risk. A comparison of the expected public cost versus the private costs of Options 2 and 3 shows a clear net savings to licensees by shifting some of the risk to the public sector. However this would be accomplished at the expense of increasing to some extent the potential for Federal government involvement in satisfying public liability claims. Furthermore, lowering the licensees' liability in the event of an accident could be problematic in terms of the public's perception.

Preferred Option: Given these considerations, the staff concludes that the preferred option is Option 2. It provides licensees with a significant amount of relief in reduced insurance premiums following permanent shutdown, and unlike Option 3, does so without shifting any of the risks to the public sector or jeopardizing the financial protection requirements during this period. It further provides a simplified approach for implementation by limiting the critical cladding temperature of the spent fuel before reducing financial protection requirements and focuses on the onsite mobile sources of radioactivity and site activities. It provides licensees a reduced financial burden with no compromise in health and safety. Licensees will have an option to use a computer code developed by BNL for the NRC to calculate the transition time period from reactor configuration 1 to reactor configuration 2 for their facilities. In addition, a new section §140.11(a)(5) will be added which will specify financial protection requirements for permanently shutdown reactors which are not authorized to operate.

The amounts proposed for offsite coverage requirements for reactor configurations 2, 3, and 4 were developed to ensure the public is fully protected against low probability events even though the NRC staff considers that any such events would have negligible offsite consequences, and to protect the Federal government from indemnity claims. The burden would remain on licensees to maintain adequate coverage for payment of claims in the event a licensee experiences an unlikely nuclear incident, whether or not there are any detrimental consequences.

These recommendations apply only to permanently shutdown nuclear power reactors. The staff will address the financial protection requirements for ISFSIs after current efforts dealing with technical and licensing issues for ISFSIs are resolved in the areas of safeguard requirements, emergency planning, and potential fuel storage handling activities. The results of these efforts will provide the staff with information for evaluating the need for financial protection requirements.

OGC'S LEGAL SUFFICIENCY ANALYSIS DEMONSTRATING THAT NO KNOWN BASIS EXISTS FOR LEGAL OBJECTION

The options for the rulemaking delineated in this plan are within the authority of the Commission, granted to the agency to protect the public health and safety through licensing of commercial production and utilization facilities under the Atomic Energy Act of 1954, as amended, and within the provisions of section 170 of that Act (Price Anderson).

This rulemaking would amend the financial protection requirements associated with permanently shutdown facilities permitting burden reductions for licensees. The scope of the backfit provisions in 10 CFR 50.109 is limited to construction and operation of nuclear reactors. This rulemaking would only apply to reactors that have permanently ceased operations. Therefore, the backfit rule does not apply to these proposed changes.

AGREEMENT STATE CONSIDERATIONS

Although Agreement States do not license power reactors, agencies of such States are involved in overseeing rate cases related to these facilities. Input from the Agreement States will be sought on this plan.

SUPPORTING DOCUMENTS

A regulatory analysis, environmental assessment, and an OMB package would be required to support the rulemaking.

RESOURCES REQUIRED

Resources are included in the current Five-Year Plan to complete the rulemaking. The offices involved are RES, NRR, NMSS, and OGC.

IS IT RECOMMENDED THAT THE EDO ISSUE THE RULE IN ACCORDANCE WITH MANAGEMENT DIRECTIVE 9.17?

No. The rulemaking considers a significant question of policy and should require a notation vote by the Commission.

LEAD OFFICE STAFF AND STAFF WITHIN EACH OFFICE WHO WILL BE INVOLVED

	Working Group	Office Concurrence
RES	George Mencinsky/Rajender Auluck	D.L. Morrison
NRR	Singh Bajwa/Ira Dinitz	F.J. Miraglia
NMSS	Andrew Persinko	C.A. Paperiello
OGC	Stephen Lewis	W.J. Olmstead

USE OF STEERING GROUP

No. This rulemaking effort would not be expected to benefit from the use of a

steering group.

PUBLIC PARTICIPATION

This Rulemaking Plan will be placed on an electronic bulletin board following EDO approval and Commission review. The public will have the opportunity to comment on the proposed rule after it is published in the Federal Register.

SCHEDULE

Expressed in terms of time from approval of the Rulemaking Plan.

Proposed rule to EDO	5 months
Public comment period ends	8 months
Final rule to EDO	1 year

TABLE 1

FINANCIAL PROTECTION EXEMPTIONS IN EFFECT AT PERMANENTLY SHUTDOWN PLANTS

PLANTS	ONSITE (50.54(W))	OFFSITE (140.11 - PRICE ANDERSON)	
		PRIMARY FINANCIAL PROTECTION (\$ MILLION)	SECONDARY FINANCIAL PROTECTION (YES/NO)
RANCHO SECO	50.0	100	NO
LACROSSE	180.0	30.6	NO
YANKEE ROWE	5.0	100	NO
HUMBOLT BAY	63.2	50	NO
TROJAN	5.0	100	NO

* NOTE: Plants listed above have spent fuel stored onsite in the spent fuel pool.