

Draft

*Based on staff's draft assessment. Changes that impact rulemaking will be factored in at a later date.*

**From:** Richard Barrett, *NRC*  
**To:** Cheok, Michael, Huffman, William, Kelly, Glenn, ... *NRC*  
**Date:** Mon, May 8, 2000 7:13 AM  
**Subject:** Re: Decommissioning rulemaking package

Bill:

I have looked at the sections you referenced. It appears that you see the commitments as only applicable to those licensees who want to reduce EP requirements. That's a different perspective than I had. I will have to think about whether I believe that covers the waterfront. Why wouldn't the commitments deserve the same level of attention as Operator Training and Staffing? In fact, since all licensees want to go to fuel handlers, why doesn't it apply to all licensees? I'll have to think about it. In any event you should add words about this requirement to the table on page 6 (under Period 2).

--Rich

>>> William Huffman 05/05 3:16 PM >>>

Rich, this is not correct. We note on page 7 of the rulemaking plan that the NEI commitments will need to be addressed in the DSAR. We also provide example regulatory language on page A-6 on how the commitments would be worded. Please look at this and see if this is not what you are referring to.

Thanks ----- Bill Huffman

>>> Richard Barrett 05/05 3:06 PM >>>

I got two copies of the subject document for SPSB review. Unfortunately I unwittingly took both home today. I will bring them in Monday. DLPM wants our concurrence by 5/15/00

For now, I have one comment. The package makes no provision for codifying the NEI commitments and NRC assumptions. I think it is crucial to add some such provision. My proposal some months ago was for a performance based approach.

--Rich

**CC:** Dudley, Richard

*B1 263*

# NRR ROUTING SLIP

*Rich*  
2 copies for  
review by SPSB.  
Comments and/or  
concerns  
by 5/15/00  
Give comments  
to Bill Huffman  
G. Hubbard

DOCUMENT NAME:

INTEGRATED RULEMAKING PLAN FOR DECOMMISSIONING  
NUCLEAR POWER PLANTS

ORIGINATOR NAME:

BILL HUFFMAN

NAME	DATE
Tech Editor	
B Huffman	
C. Jamerson (LA)	
M. Masnik	
S. Richards	
D. Barss	
E. Fox	
R. Pelton	
D. Trimble	
R. Skelton	
R. Rosano	
G. Tracy	
I. Dinitz	
B. Zalcmán	
G. Mencinsky	
M. Malloy	
C. Carpenter	
R. Barrett	
J. Hannon	
G. Holahan	
B. Boger	
D. Matthews	
J. Zwolinski	
B. Sheron	
J. Johnson	
S. Collins	

**FOR:** The Commissioners

**FROM:** William D. Travers  
Executive Director for Operations

**SUBJECT:** INTEGRATED RULEMAKING PLAN FOR NUCLEAR POWER PLANT  
DECOMMISSIONING

**PURPOSE:**

To request Commission approval to proceed with developing an integrated rulemaking for nuclear power plant decommissioning in accordance with the recommendations detailed in the attached rulemaking plan. The regulatory areas addressed by this rulemaking plan include emergency planning (EP), insurance, safeguards, backfit, and operator staffing and training.

**BACKGROUND:**

Since the early 1990's, the staff has been involved in a broad effort to eliminate unnecessary regulatory burdens for nuclear power plants that are permanently shutdown and in the process of decommissioning. Nonetheless, decommissioning regulatory improvements in certain areas such as EP, insurance, and safeguards, have proven to be difficult because of incomplete technical understanding of the dominant risk associated with decommissioning plants (i.e., a beyond design basis zirconium fire event in the spent fuel pool). A zirconium fire is a very low probability event associated with uncovering of the spent fuel within several years after shutdown from power operation. Uncovering of the spent fuel is postulated to occur from various *sufficiently* unlikely event initiators such as a severe earthquake, heavy cask drop, or by sabotage. Under certain *low frequency* circumstances when the spent fuel decay heat level is high, uncovering may result in cladding heat up to the point of rapid oxidation creating an exothermic zirconium fire condition which has the potential to propagate to a large number of fuel assemblies in the spent fuel pool (SFP). The offsite consequences of a zirconium fire would be severe. Because EP, insurance, and safeguards regulations are intended to provide some protection to the public from beyond design basis events, the staff had to carefully consider the technical issues associated with the zirconium fire before recommending reductions in the requirements of these regulations for decommissioning plants. Initially, the staff focused on developing an analytical capability to determine when spent fuel in the SFP had cooled sufficiently such that a zirconium fire was no longer possible. However, due to large uncertainties in both the thermal-hydraulics of a zirconium fire and the assumptions related to the physical configuration of the spent fuel following a severe accident (such as spacing and air cooling flows) the staff was unable to develop a standard calculation methodology that could be used to predict plant-specific SFP heat up scenarios. As a result, the staff lacked a technical basis for determining when decommissioning regulations could be relaxed on a generic basis.

**CONTACT:** Bill Huffman, NRR/DLPM  
(301) 415-1141

During a Commission meeting on March 17, 1999, the staff suggested that decommissioning rulemaking activities in the areas of EP, insurance, and safeguards could benefit from a risk assessment of SFP accidents. Subsequently, the staff issued SECY-99-168 dated June 30, 1999, which committed to providing a detailed technical assessment of risk of SFP accidents at decommissioning nuclear power plants. The SECY also recommended that operator staffing and training, and backfit regulations be included with EP, insurance, and safeguards for development into integrated, risk-informed decommissioning rule. Regulatory decision-making for the integrated rulemaking plan would be based on risk-informed principles to be defined in the detailed technical study of decommissioning plant SFP risk. Preparing the rulemaking plan as an integrated package would ensure that the regulatory decision-making was made in a unified manner with a consistent technical basis. A staff requirements memorandum dated December 21, 1999, approved the SECY-99-168 recommendation for development of a single, integrated, risk-informed decommissioning rulemaking plan.

The technical study on SFP risk at decommissioning nuclear power plants has now been completed through the final draft stage and provides sufficient information to allow rulemaking activities to progress. The report estimated that one year following permanent cessation of operations, the dominant scenario leading to zirconium fires at decommissioning plants is a beyond design basis earthquake with a generic frequency of less than  $3E-6$  per year for a plant that implements the design and operational features assumed in the staff's risk assessment, including numerous industry commitments. Zirconium fire probabilities could be much higher for facilities which have not implemented industry commitments. However, the overall frequency of a fuel uncover event leading to a zirconium fire compares favorably with large early release baseline guideline of  $1E-5$  per year in regulatory guide 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes to the Licensing Basis." In addition, the technical report concludes that after five years of spent fuel decay time, the generic vulnerability of spent fuel to a zirconium fire is effectively non-existent based on conservative thermal-hydraulic calculations combined with the low probability of the event. Accordingly, the staff has developed a risk-informed rulemaking plan which recommends an approach for proceeding with rulemaking in the regulatory areas of EP, insurance, safeguards, backfit, and operator staffing and training for decommissioning nuclear power plants which is consistent with the technical study on SFP accident risk. The proposed approach also takes into account past licensing practices, previous efforts in developing rulemaking in these areas, and provides an integrated perspective by consistently applying the NRC outcome goals of maintaining safety, reducing unnecessary regulatory burden, increasing public confidence, and improving efficiency and effectiveness.

*awaiting  
Jve's  
analysis*

⑦

DISCUSSION:

The attached rulemaking plan would amend regulations in the areas of EP, insurance, safeguards, backfit, and operator staffing and training for licensees who certified, pursuant to 10 CFR 50.82(a), that they have permanently ceased facility operation(s) and have permanently removed fuel from the reactor vessel. The proposed rulemaking plan is consistent with previous

*Must await Joe's analysis*

decommissioning rulemaking activities in these areas but will subsume or supersede all earlier efforts. The following paragraphs contain a brief description of the recommended regulatory changes.

### Emergency Planning

*fully or partially*

This part of the integrated rulemaking recommends that new regulations be developed and included in 10 CFR 50.47, 10 CFR 54, and Appendix E to 10 CFR Part 50 to specify appropriate levels of EP requirements for decommissioning nuclear power plants. The approach would permit a phased reduction in the level of EP at one year with more significant reductions when a decommissioning licensee has demonstrated that the decay heat level of spent fuel in the pool is low enough that the fuel would not be susceptible to a zirconium fire if ~~all~~ coolant were drained from the SFP or five years of decay time has elapsed. ~~At one year, licensees would be permitted to make substantial reductions to the emergency response program. The effectiveness of the reduced program would be verified in a one-time-only exercise at the time of transition to the reduced EP program.~~ Some requirements, such as the need to maintain an emergency response facility, an operations support center, and a technical support center, as well as capability for prompt notification of the public, could be eliminated at one year. The EP program at five years would be the same as that required for ISFSIs. EP would be discontinued when there is no longer any spent fuel onsite and no other radiological hazards exist onsite such that offsite doses in the event of a radiological accident would exceed the EPA PAGs at the site boundary.

### Insurance

*fully or partially*

The staff proposes amendments to 10 CFR 50.54(w) and 10 CFR 140.11 to allow phased reductions in the required level of onsite and offsite insurance coverage beginning when a decommissioning licensee has demonstrated that the decay heat level of spent fuel in the pool is low enough that the fuel would not be susceptible to a zirconium fire if ~~all~~ coolant were drained from the SFP or five years of decay time has elapsed. ~~Initially, licensees would be allowed to reduce onsite property damage insurance coverage from \$1.06 billion to \$25 million. No onsite insurance would be required after spent fuel is removed from the pool. Offsite liability insurance would drop by reducing primary coverage from \$200 million to \$100 million and by not requiring licensees to participate in the secondary retrospective rating pool. Offsite coverage would be further reduced to \$25 million when spent fuel was removed from the pool.~~

*when is "initially"?*

### Safeguards

The staff proposes using 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage," as a draft to develop a new rule that address the threat of sabotage as it relates to decommissioning plants. This new rule

will contain the critical elements of Section 73.55 (e.g. physical barriers, armed security personnel, and vehicle control measures), but will reduce the requirements where appropriate to adequately protect the area of main concern for decommissioning plants - the SFP.

#### Operator Staffing and Training <sup>to</sup>

This part of the integrated rulemaking would amend 10 CFR 50.54(m), 10 CFR 50.120, and the definitions section of 10 CFR Part 50, specify appropriate levels of training, qualifications, and authorities for operation and support staff at decommissioning nuclear power plants. The recommended changes establish the regulatory basis for the certified fuel handler program and codify appropriate staff levels at permanently shutdown and defueled reactor facilities consistent with current exemption practices. By codifying the regulations in this area, a more uniform justification for the licensee submittals and the staff actions can be established and the potential for eliminating unnecessary regulatory burden exists. Defining the minimum levels of plant staffing will ensure that permanently shutdown facilities are properly maintained, systems are safely operated, radiological activities are safely performed, and emergency response capability is preserved.

#### Backfit

The staff proposes dividing 10 CFR 50.109, "Backfitting," into two parts. One part of the new Section 50.109 will apply to operating reactors, and one part will apply to decommissioning reactors. The operating reactor part will remain virtually the same as the current Section 50.109 with small changes to accommodate the addition of the decommissioning reactor part. The new decommissioning reactor part will be similar to the operating reactor part in that the intent of the current backfit rule will apply to decommissioning reactors. The changes to make the new decommissioning part will entail removing or changing language that does not, in practice, apply to decommissioning reactors.

The attached rulemaking plan has considered applicable stakeholder comments received during the development of the SFP accident risk study including those provided during a Commission meeting dated November 8, 1999. One concern expressed that the focus of the rulemaking effort was not addressing realistic accident scenarios at decommissioning plants that may have offsite consequences. The staff's proposed rulemaking plan recommends that before phased-in reductions in EP or insurance can be permitted, the licensee assess the site-specific conditions during decommissioning and confirm that offsite doses in the event of a radiological accident would not exceed the EPA PAGs at the site boundary. Specific stakeholder comments and staff responses will be included in the final report on SFP accident risk at decommissioning plants.

The staff believes that, in general, the proposed rulemaking plan will not have any backfit implications. The proposed rule to be developed based on this rulemaking plan will not require a backfit analysis under 10 CFR 50.109 (with a possible exception as noted below). The proposed rule changes could be viewed as a voluntary relaxation, since it appears that licensees could continue to maintain their existing EP, insurance, physical security, staffing requirements, and backfit policy and be in compliance with the proposed changes

recommended in this rulemaking plan. As such, if licensees are not compelled to change their existing programs, then there is no "imposed change" constituting a backfit as defined in Section 50.109(a)(1). The staff does recommend in this rulemaking plan that the SFP at decommissioning plants be considered a vital area. The SFP at operating plants, by current practice, is not required to be a vital area. The staff is still considering the backfit implications of this policy change and what affects it will have on both operating and decommissioning plants. The staff will address this further in the proposed rule to the Commission if a backfit assessment demonstrates this policy decision is justified.

The staff has kept the Federal Emergency Management Agency (FEMA) informed on the development and recommendations of this rulemaking plan. Although FEMA has not endorsed this plan, the staff has not received any formal objections to the staff's approach. The staff will obtain FEMA support of the proposed rule prior to submitting it to the Commission for approval.

*What about comments?  
draft FEMA comments?*

#### AGREEMENT STATE IMPLEMENTATION ISSUES:

The proposed rulemaking would not result in any additional regulatory burden to Agreement States.

#### COORDINATION:

The Office of Nuclear Material Safety and Safeguards had no objections to the rulemaking plan. The Office of Enforcement has no objections to the rulemaking plan. The Office of the General Counsel has no legal objection to the rulemaking plan. The Office of the Chief Financial Officer has reviewed this Commission Paper for resource implications and has no objection. The Office of the Chief Information Officer has reviewed the rulemaking plan for information technology and information management implications and concurs in it. However, the plan suggests changes in information collection requirements that may require submission to the Office of Management and Budget at the same time the rule is forwarded to the *Federal Register* for publication. The Office of State Programs has no objections to the rulemaking plan.

#### RESOURCES

The resource estimate to complete this rulemaking is approximately 6 FTE ( 1.5 FTE in FY 2000, 2.5 FTE in FY 2001 and 2 FTE in 2002) which is available within the current budget. In addition, 250K in contractor support is anticipated which will need to be reprogrammed.

#### RECOMMENDATION:

I intend to proceed with the development of the rulemaking in accordance with the recommendation of the attached rulemaking plan unless otherwise directed by the Commission within ten days from the date of this paper. In addition, in order to foster early stakeholder

interaction in development of the specific proposed regulatory language the staff intends to make this SECY publically available within ten days from the date of this paper.

William D. Travers  
Executive Director  
for Operations

Attachment: Rulemaking Plan

**DISTRIBUTION:**

Commissioners

OGC

OCAA

OIG

OPA

OCA

ACRS

CIO

CFO

EDO

REGIONS

SECY





**INTEGRATED RULEMAKING PLAN  
FOR  
EMERGENCY PLANNING, INSURANCE, SAFEGUARDS  
OPERATOR STAFFING AND TRAINING, AND BACKFIT  
AT DECOMMISSIONING NUCLEAR POWER PLANTS**

**Lead Office: Office of Nuclear Reactor Regulation**

**Staff Contact: William Huffman  
(415-1141)**

**Phillip Ray  
(415-2972)**

**Concurrences:**

**William F. Kane, NMSS Date**

**Ashok C. Thadani, RES Date**

**R. William Borchardt, OE Date**

**J. Gray, OGC Date**

**J. Funches, CFO Date**

**A. Galante, CIO Date**

**P. Lohaus, OSP Date**

**D. Meyers, ADM Date**

**B. Shelton, OCIO Date**

**D. Matthews, DRPM/NRR Date**

**J. Silber, PMAS/NRR Date**

INTRODUCTION .....	1
BACKGROUND .....	1
REGULATORY ASSESSMENTS .....	3
<b>A. Emergency Planning</b> .....	3
REGULATORY ISSUE .....	3
EXISTING REGULATORY FRAMEWORK .....	4
DISCUSSION .....	4
RULEMAKING OPTIONS .....	8
RECOMMENDED APPROACH .....	11
<b>B. Insurance</b> .....	12
REGULATORY ISSUE .....	12
EXISTING REGULATORY FRAMEWORK .....	12
DISCUSSION .....	12
RULEMAKING OPTIONS .....	14
RECOMMENDED APPROACH .....	15
<b>C. Safeguards</b> .....	15
REGULATORY ISSUE .....	15
EXISTING REGULATORY FRAMEWORK .....	15
DISCUSSION .....	16
RULEMAKING OPTIONS .....	17
RECOMMENDED APPROACH .....	19
<b>D. Operator Staffing and Training</b> .....	20
REGULATORY ISSUE .....	20
EXISTING REGULATORY FRAMEWORK .....	20
DISCUSSION .....	21
RULEMAKING OPTIONS .....	23
RECOMMEND APPROACH .....	26
<b>E. Backfit</b> .....	26
REGULATORY ISSUE .....	26
EXISTING REGULATORY FRAMEWORK .....	26
DISCUSSION .....	27
RULEMAKING OPTIONS .....	28
RECOMMEND APPROACH .....	28
OGC ANALYSIS .....	29
BACKFIT ANALYSIS .....	29
COMPATIBILITY OF AGREEMENT STATE REGULATIONS .....	30
SUPPORTING DOCUMENTS .....	30
SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT .....	30
RESOURCES .....	31
LEAD OFFICE STAFF AND STAFF FROM SUPPORTING OFFICES .....	31

STEERING GROUP .....	31
ENHANCED PUBLIC PARTICIPATION .....	31
EDO OR COMMISSION ISSUANCE.....	31
SCHEDULE .....	32
APPENDICES .....	33
A Example Regulatory Language for EP at Decommissioning Plants .....	A-1
B.Example Regulatory Language for Insurance at Decommissioning Plants .....	B-1
C.Example Regulatory Language for Security at Decommissioning Plants.....	C-1
D.Example Regulatory Language for Operator Staffing and Training .....	D-1
E.Example Regulatory Language for Applying the Backfit Rule .....	E-1

**INTEGRATED RULEMAKING PLAN  
FOR  
EMERGENCY PLANNING, INSURANCE, SAFEGUARDS  
OPERATOR STAFFING AND TRAINING, AND BACKFIT  
AT DECOMMISSIONING NUCLEAR POWER PLANTS**

**INTRODUCTION:**

In accordance with Commission direction in the staff requirements memorandum (SRM) for SECY-99-168, "Improving Decommissioning Regulations for Nuclear Power Plants," the staff has developed a rulemaking plan which recommends an approach for proceeding with rulemaking in the regulatory areas of emergency planning (EP), insurance, safeguards, backfit, and operator staffing and training for decommissioning<sup>1</sup> nuclear power plants. The staff's recommendations take into account the risk posed by decommissioning nuclear power plants, past licensing practices, and previous efforts in developing rulemaking in these areas. The proposed approach also provides an integrated perspective in the overall plan by consistently applying the NRC outcome goals of maintaining safety, reducing unnecessary regulatory burden, increasing public confidence, and improving efficiency and effectiveness.

**BACKGROUND:**

Current Nuclear Regulatory Commission (NRC) regulations pertaining to nuclear power reactors are primarily directed toward the safety of facilities that are licensed to operate. As reactors are permanently shutdown and enter decommissioning, the NRC has been faced with establishing the appropriate requirements and regulatory oversight necessary to provide adequate protection to the public. Although applying the existing operating reactor regulatory requirements to decommissioning facilities ensures safety, many requirements are excessive and result in unnecessary regulatory burden. In some areas, amending decommissioning regulations has been relatively straightforward and appropriate rulemaking has been readily developed. Accordingly, in July 1996, the Commission issued a major rule on decommissioning nuclear power reactors in its ongoing effort to enhance decommissioning regulations. The 1996 decommissioning rule made fundamental changes to power reactor decommissioning by streamlining the process and reducing both licensee and NRC resource expenditures while maintaining safety and encouraging public involvement. Since the early 1990's, the NRC has been aware of other decommissioning regulations that were also in need of change to eliminate unnecessary regulatory burden. These regulations include emergency preparedness, onsite and offsite insurance, and safeguards. These regulations were not modified in 1996 because the NRC had not yet resolved technical issues associated with risk at decommissioning plants for which the design basis events and traditional accident sequences that dominate operating reactor risk are not applicable.

---

<sup>1</sup>Throughout this rulemaking plan, decommissioning will be used to refer to any phase of nuclear power plant decommissioning from the time a plant submits its certifications of permanently shutdown and defueled status until license termination.

*Sufficiently*

Public risk from decommissioning nuclear power plants is dominated by the potential for accidents that could result in uncovering of the spent fuel stored in the spent fuel pool (SFP). Uncovering of the spent fuel (in conjunction with other exacerbating conditions such as high decay heat levels, close-packed geometry, low air cooling flow rates, etc.), could lead to cladding heat up to a point of rapid oxidation - resulting in a so-called zirconium fire. Consideration of a zirconium fire event is beyond design basis for operating reactors. Although it requires the postulation of an accident that exceeds the design and licensing bases of a plant to cause a spent fuel zirconium fire, the NRC had to carefully investigate the technical issues associated with this accident since the regulations in question (insurance, emergency preparedness, and safeguards) were intended to protect the public from beyond design-basis events. The staff had previously examined the risk of SFP zirconium fires at operating reactors during resolution of Generic Issue 82, "Beyond Design Basis Accidents in Spent Fuel Pools." Notwithstanding that the risk associated with a zirconium fire did not pass the backfit test for modifying designs, procedures, or regulations for operating reactors, the Commission has repeatedly endorsed using non-vulnerability to a zirconium fire as part of the basis for determining when certain regulations can be relaxed for decommissioning facilities [SRM on SECY-93-127 for insurance; SRM on SECY-97-120 for EP]. In 1998, Maine Yankee challenged the staff's position on using non-vulnerability to a zirconium fire accident as one of the criteria for decommissioning EP exemptions. Maine Yankee claimed that requesting a licensee to provide a thermal-hydraulic (T-H) analysis demonstrating that the spent fuel is no longer vulnerable to a zirconium fire constituted a backfit since a zirconium fire is beyond design basis and not part of the original licensing basis of the spent fuel pool. The staff established that EP is provided, in part, to mitigate the consequences of beyond design basis accidents (such as zirconium fires). Therefore, requesting a licensee to demonstrate non-vulnerability of the spent fuel stored in the SFP to a zirconium fire for the purpose of evaluating an exemption request to reduce emergency preparedness does not constitute the imposition of a new or different interpretation of previously applicable regulatory staff positions. Consequently, the backfit claim was denied and assessment of vulnerability to zirconium fires remained as one of the considerations for processing decommissioning EP exemptions. Consistent with existing regulatory requirements for all licensees, offsite EP is required when an evaluation shows that it is possible to exceed the Environmental Protection Agency (EPA) Protective Action Guidelines (PAGs) offsite due to the release of radioactive material.

The staff has previously initiated rulemaking efforts in the areas of EP and insurance for decommissioning nuclear power plants. One aspect of these rulemakings was to identify a spent fuel decay time after which a zirconium fire is no longer possible. Because the staff lacked a comprehensive analyses supporting a bounding spent fuel decay time value for vulnerability to zirconium fires, regulatory proposals for EP and insurance based on decay times were not technically defensible. A rulemaking plan was also approved by the Commission for decommissioning safeguards but did not consider how zirconium fire vulnerability might impact the recommended SFP security requirements. Because of the uncertainties associated with the risk and time frame for zirconium fire vulnerability, the staff suspended its decommissioning rulemaking efforts until the associated technical issues could be satisfactorily resolved.

During a Commission meeting on March 17, 1999, the staff suggested that decommissioning rulemaking activities in the areas of EP, insurance, and safeguards could benefit from a risk

assessment of SFP accidents. Subsequently, the staff issued SECY-99-168 dated June 30, 1999, which recommended that operator staffing and training, and backfit regulations be included with EP, insurance, and safeguards for development into integrated, risk-informed decommissioning rule. The staff stated that regulatory decision-making for the integrated rulemaking plan would be based on risk-informed principles to be defined in a detailed technical study of decommissioning plant SFP risk. Although the staff acknowledged that it typically required an accident that exceeded the design and licensing bases of a plant to cause the loss of coolant from a spent fuel pool, the NRC had to carefully investigate these issues since several of the regulations in question (insurance, emergency preparedness, and safeguards) were intended to protect the public from beyond design-basis events. Preparing the rulemaking plan as an integrated package would ensure that the regulatory decision-making would be made in a unified manner with a consistent technical basis. A staff requirements memorandum dated December 21, 1999, approved the SECY-99-168 recommendation for a single, integrated, risk-informed decommissioning rule.

The technical study on SFP risk at decommissioning nuclear power plants has now been completed through the final draft stage and has provided sufficient recommendations to allow rulemaking activities to progress. Accordingly, the staff has subsumed previous decommissioning rulemakings efforts into this integrated, risk-informed decommissioning rulemaking plan for which the staff seeks Commission approval to develop into a proposed rule.

Discussion of the staff's recommendations for developing rulemaking in each regulatory area covered by this integrated decommissioning rulemaking plan is addressed in the respective sections of this plan. Included in the discussion is an overview of the impact of the technical risk study on the staff's recommendations, any changes that differ from related rulemaking plans previously approved by the Commission (i.e., rulemaking plans for EP, insurance, and safeguards), and any potential issues that may emerge as the rulemaking progresses. Attached to this rulemaking plan are examples of regulatory language that would implement the staff's recommendations. The example language is provided to enhance understanding of the staff's objectives but may not reflect the content or format of the proposed rule to be subsequently developed and submitted for Commission approval.

## REGULATORY ASSESSMENTS

### A. Emergency Planning

#### REGULATORY ISSUE

The need for rulemaking in this regulatory area is to establish an appropriate level of emergency planning and preparedness requirements for a nuclear power plant site at which all reactors have permanently shutdown and been defueled. This part of the integrated rulemaking plan recommends that decommissioning nuclear power plant regulations be developed that reduce emergency planning programs after a sufficient amount of spent fuel decay time has elapsed and offsite doses from postulated radiological accidents can no longer exceed the EPA PAGs. The proposed rulemaking plan is part of an integrated staff effort to reduce regulatory burdens, improve regulatory decision making, and make more efficient use of NRC resources for

*Design bases or  
severe  
accident?*

decommissioning nuclear power plants. The proposed rulemaking plan would lead to the development of a rulemaking which defines the level of emergency planning appropriate for a decommissioning reactor site from the time of permanent shutdown until no offsite emergency planning would be required. The proposed plan should also result in a rule that reduces the need for future exemptions and provides emergency planning requirements appropriate for the conditions at the decommissioning site.

**EXISTING REGULATORY FRAMEWORK**

The regulations governing emergency planning for nuclear power reactors are set forth in 10 CFR 50.47, 10 CFR 50.54(q), (s), and (t), and Appendix E to 10 CFR Part 50. The regulations require that each nuclear power reactor licensee establish and maintain emergency plans and preparedness in accordance with the above regulations. The regulations do not reflect that at a decommissioning plant the spectrum of severe accidents that involve the potential for significant offsite consequences is greatly reduced and dominated by the concern of a zirconium fire in the SFP. Specifically, the regulations do not recognize that there is considerably more time available to respond to postulated scenarios that could lead to a zirconium fire accident than is available for many postulated operating reactor accidents. The regulations also do not contain any provisions for reducing EP requirements when the spent fuel stored in the SFP is no longer vulnerable to a zirconium fire. Exemptions are typically requested and granted on a case-by-case basis from many of these EP requirements during the early phase of decommissioning a nuclear power plant.

**DISCUSSION**

During decommissioning, the principal public safety concerns involve spent fuel storage. Spent fuel removed from the permanently shutdown and defueled reactor is stored in the spent fuel pool (SFP) until it is either transferred to an onsite independent spent fuel storage installation (ISFSI) or moved offsite for long-term storage or disposal. For a period of time after fuel has been irradiated in a power reactor and is being stored in a SFP, the possibility exists for an accident where the loss of water in the SFP could result in a significant heat up of the spent fuel culminating in a zirconium fire. While the consequences of a zirconium fire in the SFP at a permanently shut down reactor are in some ways comparable to releases from postulated reactor accidents at an operating reactor, the time of release occurs much later after initiation of the accident. Analyses indicate that for slowly evolving SFP accident scenarios at decommissioning plants, there is a large amount of time to initiate and implement mitigative actions or protective actions, including public evacuation if necessary, unlike operating reactor accident sequences. In addition, the frequency of a SFP accident at a decommissioning plant with offsite consequences is very low (assuming certain administrative controls and design features are in place as discussed in the staff's draft final technical study on SFP accident risk). Accordingly, it is the staff's judgment that when the spent fuel stored in the SFP has at least one year of decay time, there is a basis for relaxation of some emergency planning requirements due to the low likelihood that a zirconium fire would occur, in combination with the long time frames available for taking offsite protective actions.

Although the technical report on SFP accident risk at decommissioning reactors establishes that the frequency of accident leading to a zirconium fire condition is very low, some level of offsite

*not true for all references  
e.g. highway seismic events*

*this is same as for other severe accidents*



EP would provide meaningful public health and safety benefit for zirconium fire scenarios. Therefore, the staff has retained consideration of the zirconium fire as part of the regulatory decision-making process in developing a new EP rule for decommissioning licensees. The report noted that based on certain assumptions and licensee commitments, the frequency of a zirconium fire event at a decommissioning reactor is on the order of a large early release frequency (LERF) for operating plants. However, what distinguishes the zirconium fire accident from a large release core damage accident at an operating reactor is its slow progression and the long time period available to deal with both the accident and associated offsite emergency response. Based on this consideration, the report made the following recommendations:

...because of the considerable time available to initiate and implement protective actions, there does not appear to be a need for formal emergency plans for rapid initiation and implementation of protective actions [after one year decay time].

The principal aspects of emergency planning which are needed for SFP events [after one year decay time] are the means for identification of the event and for notification of State and local emergency response officials.

The report concludes that, from a risk perspective, reduction in the level of EP maintained at a decommissioning plant could occur as early as one year after shutdown. In addition, it indicates that five years of spent fuel decay can be used as a bounding value for zirconium fire vulnerability at all spent fuel pools when even further reductions in EP can be justified without supporting T-H analysis or review.

The staff previously submitted SECY-97-120 recommending a rulemaking plan for decommissioning plant EP. The Commission approved the rulemaking plan in an SRM dated July 10, 1997. The attached integrated rulemaking plan is consistent with the previous plan approved by the Commission. In addition, the plan is consistent with EP requirements for Independent Spent Fuel Storage Installation (ISFSI) requirements as well as requirements for licensees who possess byproduct material. Therefore, based on the staff's technical study, the following additional regulatory changes are recommended for decommissioning EP beyond those in SECY-97-120.

- That five years of spent fuel decay time be used as the regulatory cutoff time for zirconium fire vulnerability analysis. After five years (and assuming that a licensee analysis has shown that there are no other event that could result in offsite doses exceeding EPA PAGs) a licensee could reduce the EP program at a decommissioning nuclear power plant to the equivalent of the EP program required for an ISFSI. This could be done without NRC approval or preparation of a T-H analysis.
- After one year of spent fuel decay, some reductions in decommissioning plant EP can be justified provided the licensee implements the ten industry decommissioning commitments and four staff decommissioning assumptions described in the SFP risk study.

What distinguishes zirconium fire from the earliest release is at about 10 hours versus less than 1 hr for a reactor. Not true for progression + load drop

Some large releases are later than 100 hours

~~cancel~~

assuming only T-H analysis required

Joe

Joe

A summary of the regulatory approach recommended by the attached rulemaking plan for EP during decommissioning is provided below.

<p><b><u>PERIOD 1</u></b></p> <p>Minimum of one year spent fuel decay time</p>	<p>Must meet the regulatory standards for operating plants</p>
<p><b><u>PERIOD 2</u></b></p> <p>one to five years of spent fuel decay time</p>	<p>Scale back the emergency response program as appropriate while maintaining the capability to classify events up to and including a General Emergency level (based on a postulated zirconium fire) and make Protective Action Recommendations (PARs) to offsite officials</p> <p>For example, the following changes to operating plant EP would be permitted:</p> <ul style="list-style-type: none"> <li>• Eliminate the requirement for an Emergency Operations Facility, onsite Technical Support Center, and onsite Operational Support Center.</li> <li>• The capability to promptly notify the public will not be required. This change should eliminate the need for such things as the siren system, tone alert radios, or National Weather radios.</li> <li>• Change the requirement for a biennial (every 2 years) full participation exercise to a one-time only exercise which would be required at the time of transition to a reduced offsite EP program.</li> <li>• Licensee training of offsite State, local, or other personnel potentially involved in EP would be offered but would not be made mandatory.</li> <li>• Evacuation times would not need to be revised.</li> <li>• Emergency Action Levels would not need NRC approval.</li> <li>• Monthly communications checks would be changed to quarterly</li> <li>• No ingestion pathway exercises will be required.</li> </ul> <p>NOTE: During Periods 1 and 2, the licensee may choose to do a site specific analysis to determine a time shorter than five years when a zirconium fire would no longer be possible.</p>
<p><b><u>PERIOD 3</u></b></p> <p>After five years of spent fuel decay time (or until analysis demonstrates no possibility of zirc fire) and no other event could result in offsite doses exceeding EPA PAGs</p>	<p>EP requirements will be the equivalent of those for an ISFSI.</p>
<p><b><u>PERIOD 4</u></b></p> <p>No fuel onsite and no other event could result in offsite doses exceeding EPA PAGs or no radioactive material quantities onsite exceeding 30.72 Schedule C limits</p>	<p>No EP is required.</p>

The item of most significance to stakeholders will be the degree of reduction in EP after one year. Although the technical risk study implies that offsite EP can be scaled-back, the staff has been able to identify only minor changes to specific EP regulations that can be made at the one year time frame. For example, the staff determined that the capability for prompt notification of the public would no longer be necessary after one year in consideration of the slow progression of a postulated events and the long time period to take mitigative actions. However, since the consequences of a zirconium fire event can be as significant as a core melt accident with a large release, and because the frequency of the zirconium fire is similar to that of a core melt LERF, it is difficult to justify a reduction in the level of event classification during the period that a zirconium fire is possible. The staff believes that a licensee should maintain a General Emergency classification level for the zirconium fire. Consequently, to support an offsite response at the General Emergency level, the actual regulatory requirements will not change substantially during the period of time that a zirconium fire is possible at a decommissioning nuclear power plant.

would be imprudent to seek

Notwithstanding the ostensibly minor changes to EP after one year of spent fuel decay, the staff believes that the EP program needed to respond to a zirconium fire or other events could be significantly reduced and still provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Even if the regulatory requirements are not substantially changed, the size of the emergency response organization (ERO) can be reduced and associated decommissioning emergency plans simplified and still meet the requirements of the current regulations.

Need to explain why can't just stay for operating P. or shouldn't EP similarly reduce

Changes to the emergency plan, procedures, and ERO when transitioning from an operating EP program to decommissioning EP would not be considered a decrease in the effectiveness of the plans because the basis for the plans has changed. Since the basis for the emergency plan has changed, it is expected that the plan would be reviewed and revised to be consistent with these changes. Therefore, the staff also believes that a licensee should be permitted to make these changes without NRC approval. This is consistent with existing regulatory conditions that allow licensees to make changes without NRC approval, provided the changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet established regulatory standards and requirements.

by the licensee

Changes to onsite emergency plans and procedures would also need to be coordinated with offsite plans and procedures. The interface and interaction of onsite and offsite plans would need to be adjusted as occurs with any plan change. An exercise of the revised plans would be required to evaluate major portions of the emergency response capability. This exercise would test as much of the licensee, State, and local plans as is reasonably achievable.

As noted previously, the technical risk study on SFP accidents at decommissioning plants conditioned its conclusion that EP regulations could be relaxed at one year upon the implementation of ten industry commitments and four staff assumptions as described in detail in the study. The staff envisions high level requirements in the integrated decommissioning rule to have licensees address and document the plant specific design and administrative measures that minimize the risk of SFP accidents. The documentation would be provided by the licensee in the decommissioning safety analysis report (DSAR) and would be expected to address the commitments and assumptions in the SFP technical study in detail. The DSAR description

This can be changed by licensee at any time w/o NRC review + approval. Commitments in DSAR. SO. SA at decom. plants are not reviewed.

*We don't approve commitments any terms unless they are part of a license amendment*

would not have to be approved by the NRC. In addition, implementation of the industry and staff assumptions during decommissioning will not be necessary if the licensee maintains a an EP program consistent with existing regulations for operating reactors until its spent fuel pool is no longer susceptible to a zirconium fire. Since the EP reduction at one year and associated additional regulatory commitments would be voluntary, this aspect of the rulemaking is not a backfit.

*would need to inspec*  
*heavy load*  
*drop*  
*at all*  
*Decommission*

*for the references analyzed*

The technical report provided an estimate of five years after shutdown as a conservative decay time after which the zirconium fire can be dismissed for all spent fuel configurations based on current spent fuel maximum allowable burnups and SFP rack designs and densities. However, the staff believes that many licensees may not find it economically advantageous to wait five years before obtaining substantial reductions in offsite EP if T-H conditions at their facilities indicate that the zirconium fire vulnerability time is much less than five years. The EP rulemaking plan will permit a site specific analysis demonstrating that the spent fuel is no longer susceptible to a zirconium fire. To support a deterministic analysis of SFP vulnerability to a zirconium fire, the staff will need to develop a regulatory guide as part of the rulemaking process.

The staff concludes that amending the emergency planning regulations as detailed in this integrated rulemaking plan for decommissioning will provide for reduction of regulatory burden commensurate with the documented risk of SFP accidents during decommissioning and, therefore, does not compromise health and safety. The proposed integrated approach contained in the rulemaking plan ensures consistency with the other decommissioning rulemaking areas being amended and consistency with existing requirements for the storage of spent fuel in ISFSIs and the possession of byproduct materials.

**RULEMAKING OPTIONS**

The following discussion provides a preliminary qualitative regulatory assessment of the proposed rulemaking and several possible alternatives:

OPTION 1: Revise regulations to provide a tiered approach to EP for permanently shutdown reactors.

The proposed rule would maintain EP as now required by 10 CFR 50.54(q) for one year after shutdown.

Then from one to five years after shutdown require EP similar to that for operating reactors with some modifications. The modification would include eliminating the need for communication systems currently required to provide for the early notification of the public and the need for licensees to demonstrate that offsite officials have the capability to make a prompt notification decisions. This is due to the extended time available to take protective actions if called for. Also, eliminate the need for biennial participation in exercises by offsite agencies. However, the licensee would need to document in the decommissioning safety analysis report (DSAR) how SFP accident risk reduction measures will be implemented for the site.

After being shutdown five years, and as long as there is fuel stored on site, the proposed rule would require EP similar to that for ISFSI's identified in 10 CFR 72.32(a), as long as the onsite inventory of radioactive materials is above quantities specified in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Material Requiring Consideration of the Need for an Emergency Plan for Responding to a Release," and the licensee does a site specific evaluation showing that the maximum dose to a person offsite due to a release of radioactive material would not exceed the EPA PAGs at the site boundary.

There would be no need for offsite EP requirements when spent fuel is no longer stored onsite provided that for other radioactive material stored onsite, the offsite dose from any radiological accident would not exceed the EPA PAGs at the site boundary. In addition, no EP is needed if the inventory of radioactive material stored onsite is below the quantities specified in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Material Requiring Consideration of the Need for an Emergency Plan for Responding to a Release."

#### ASSESSMENT OF OPTION 1

The regulatory requirements are not proposed to change much during the first 60 months after the reactor shuts down. This is because the licensee still needs to have the capability to respond to the possibility of a substantial offsite release resulting from a SFP drainage accident followed by a zirconium fire. The licensee would retain the need to classify events up to and including the General Emergency level and make protective action recommendations to the offsite officials. However, the timing of the release in relation to the initiating events will grow longer as time passes after shutdown. Also, planning for the zirconium fire event is much simpler than planning for the myriad of reactor operating events that could lead to substantial offsite releases. Accordingly, the emergency response program and staffing needed for a decommissioning plant should be capable of sustaining sizable reductions from that required for an operating reactor and still carry out an effective emergency plan. Although the EP requirements may not be changed significantly in the first five years, the complexity of the emergency response program and the size of the needed emergency response organization (ERO) can be significantly reduced and still meet the requirements of the regulations. Since a general emergency at decommissioned sites could only be due to a zirconium fire event, this would represent a reduction in the basis for the site EP when compared with operating reactor EP. Because there is a change in the basis for the emergency plan, the changes associated with this new basis would not be considered as decreasing the effectiveness of the plan. Therefore, a licensee could make these changes without NRC approval.

*new* After the first 12 months, the elimination of the requirement for communication system capability for making early notifications to the public would be relaxed. This would eliminate the need for a siren system, or other such communication systems like tone alert radios or National Weather Service radios for immediate notification of the public.

Relaxation of the requirement for an onsite technical support center (TSC), operational support center (OSC), and emergency operations facility (EOF), will allow the licensee to consolidate emergency response activities to one facility. This will allow a reduction in the actual physical facilities that are maintained for emergency response. It will also contribute to the simplification of the ERO with less staff needed for facilities manning.

Elimination of mandatory offsite participation in biennial exercise will relieve the licensee of the resource burden associated with the conduct and evaluation of these exercises. Opportunity for participation in drills and exercises will still be made available to offsite agencies. However, evaluation by FEMA will not be called for after the first exercise of reduced plans. Ingestion pathway exercises would no longer be required.

The licensee would also have the option not to make changes to the existing plan, procedures, and ERO. It is unlikely, however possible, that the licensee would keep existing plans and not make substantial changes for some time after shut down. The licensee would need to consider the cost of making and implementing changes compared to keep existing program in place.

#### OPTION 2 No action.

This option would maintain the current emergency planning regulations in effect. Relief from regulatory requirements during permanent reactor shutdown would continue to be done on a case-by-case basis through the exemption process for each reactor site.

#### ASSESSMENT OF OPTION 2

The no action option retains the emergency planning provisions in the current regulations. There is some inconsistency among the regulations pertaining to emergency planning that creates uncertainties in determining when permanently shutdown and defueled nuclear power reactors no longer have to maintain emergency plans. Licensees could interpret the applicable regulations to permit elimination of some emergency planning requirements based on certification of shutdown under 10 CFR 50.82(a). This potential result was not intended by the NRC staff. Complete elimination of emergency planning requirements in accordance with this interpretation would result in the NRC having a concern that emergency planning and preparedness would not be maintained when it is still necessary. Licensees would continue to be subject to these uncertainties. Licensees would need to request and likely receive exemptions from the regulations. This would continue to cause less regulatory certainty and potential inconsistencies among licensees. This option would result in higher cost to both licensees and the NRC because of the cost inefficiencies of dealing with this issue on an individual plant basis.

#### OPTION 3 Require all EP reductions to be based on deterministic T-H or radiological analysis of spent fuel and other onsite hazards

Specifically, require a licensee to do site specific T-H analysis to demonstrate that the decay heat from spent fuel is unlikely to result in a zirconium fire should the SFP be drained and perform an evaluation that offsite doses in the event of a radiological accident would not exceed the EPA PAGs at the site boundary. At that point, the required EP would be similar to that for ISFSI as identified in 10 CFR 72.32(a), as long as onsite inventory of radioactive materials is above quantities specified in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Material Requiring Consideration of the Need for an Emergency Plan for Responding to a Release."

After spent fuel is no longer stored onsite and the after onsite inventory of radioactive materials is below quantities specified in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Material Requiring Consideration of the Need for an Emergency Plan for Responding to a Release", no offsite EP would be required.

**ASSESSMENT OF OPTION 3**

This option would require licensees to do costly and complex plant specific T-H analysis which would need to be reviewed by the NRC staff. It most likely would result in a determination of a time significantly shorter than the proposed five years in Option 1 that would be required to pass before allowing elimination of requirements for offsite emergency planning.

*already  
said that  
necessary  
to do  
this to get  
less than  
5 years*

**OPTION 4 Combine Option 1 and 3**

**ASSESSMENT OF OPTION 4**

This option allows licensees to obtain orderly relief from current emergency planning requirements during permanent shutdown through a clear regulatory process established by Option 1. At the discretion of the licensee they could conduct a site specific T-H analysis to demonstrate that the decay heat, from spent fuel, necessary for a zirconium fire no longer exists. At the point in time when offsite doses in the event of a radiological accident would not exceed EPA PAG's at the site boundary the licensee would be relieved of the requirements for offsite emergency plans. This site specific analysis could significantly shorten the five year period that would be required under Option 1 for the retention of offsite emergency planning requirements.

**RECOMMENDED APPROACH**

Based on the potential for reduced costs, enhanced efficiency, and uniformity in the regulatory process for decommissioning nuclear power plants, Option 4 (as discussed above) is the recommended approach of this rulemaking plan. An example of language that would implement this option is provided at the end of this package.

**B. Insurance**

**REGULATORY ISSUE**

The need for rulemaking in this regulatory area is to determine how the NRC should codify reduced insurance requirements for permanently shutdown and defueled nuclear reactors?

**EXISTING REGULATORY FRAMEWORK**

The current requirements in 10 CFR 50.54(w) for onsite property damage liability insurance require each power reactor licensee to have a minimum of \$1.06 billion or the maximum amount

of coverage generally available from private sources. These funds would allow the licensee to stabilize and decontaminate the reactor and reactor station site after an accident. There are no provisions to reduce this coverage after a reactor shuts down permanently and begins decommissioning.

The current regulations for offsite liability coverage under 10 CFR 140.11 require licensees of each nuclear reactor which is licensed to operate and designed for the production of electrical energy and has a rated capacity of 100,000 kWe or more, to carry primary insurance coverage in the amount of \$200,000,000 from private sources and to maintain secondary financial protection in the form of private liability insurance available under an industry retrospective rating plan. Currently, the maximum obligation for secondary financial protection is \$83,900,000 for a single nuclear incident for each licensed reactor. Thus, the total financial protection available for offsite liability for any incident would be the primary layer of \$200,000,000 plus the secondary layer of \$83.9 million multiplied by the number of licensed power reactors with a rated capacity of 100,000 kWe or higher. If claims for a single incident exceeded this total, Federal government indemnity could be implemented.

The existing regulations do not take into consideration the risk reduction over time associated with permanently shutdown nuclear reactors. Insurance requirements for permanently shutdown plants have been established on a case-by-case basis by NRC review of exemption requests submitted by licensees.

## **DISCUSSION**

The current regulations governing insurance coverage for nuclear power plants do not address plants that are decommissioning. Consideration of whether insurance coverage should be reduced for decommissioning plants must 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. In addition, consideration has been given to timely payment for valid damage claims by members of the public and minimization of the likelihood that Federal Government indemnity would be exercised for satisfaction of claims for damages.

On October 30, 1997, the Commission published a proposed rule to amend regulations governing liability coverage for permanently shutdown nuclear plants. Numerous public comments were received on the proposed rule, most of which were favorable. Some of the comments suggested alternative liability limits which the staff found to be reasonable. After completing its evaluation of the comments on the proposed rule, the staff was preparing to re-propose the rule with a modified set of requirements for onsite and offsite liability coverage limits. These efforts were halted in March 1999 when the staff recommended including insurance requirements in the risk-informed, integrated rulemaking effort for decommissioning nuclear power plants.

Based on the technical study of SFP accident risk at decommissioning nuclear power plants, it is the staff's conclusion that a reduction in insurance requirements cannot be justified at decommissioning plants while vulnerability to a zirconium fire exists. Consequently, the recommendations in the attached integrated rulemaking plan for insurance are not significantly



different from the proposed rule issued by the Commission on October 30, 1997. There are some changes to address specific liability coverage amounts. In addition, based on the technical study finding that zirconium fire vulnerability can be dismissed after five years of spent fuel decay time, the attached rulemaking plan also recommends that insurance requirements be reduced at five years without any NRC approval or supporting T-H analysis. ] Joe

A summary of the regulatory approach recommended by the attached rulemaking plan for Insurance during decommissioning is provided below.

### Rulemaking Plan for Nuclear Power Plant Insurance Requirements

	On-site Accident Recovery & Cleanup Insurance (10 CFR 50.54w)	Off-Site Accident Liability Insurance Under Price-Anderson (10 CFR 140.11)
Operating Plant	\$1.06 x 10 <sup>9</sup>	Primary - \$200,000,000 Secondary - Full Participant in Secondary Pool (Potential \$83.9 Liability per Reactor)
Decommissioning Plant: 0 - 5 Years or Prior to Plant Specific T-H Analysis*	Same as Operating Plant	Same As Operating Plant
Decommissioning Plant: Longer than five years with Spent Fuel in SFP	\$25,000,000	Primary - \$100,000,000 Secondary - Not Required
Decommissioning Plant: No Spent Fuel in SFP	\$0 - No Requirement	Primary - \$25,000,000 Secondary - Not Required

\*A plant specific analysis to demonstrate that SFP is no longer thermal-hydraulically capable of sustaining a zirconium fire

The anticipated rulemaking for insurance will allow decommissioning nuclear power plant licensees to reduce onsite and offsite liability coverage when a sufficient amount of spent fuel decay time has elapsed. The recommended rulemaking approach would reduce the level of insurance coverage commensurate with the risk reduction. The proposed changes are also consistent with regulatory requirements for storage of spent fuel in ISFSIs for which insurance is not required. The proposed rulemaking plan would not impose any additional requirements on decommissioning licensees, but rather would permit a voluntary regulatory reduction of insurance coverage, and does not involve any backfit concerns.

### RULEMAKING OPTIONS

The following discussion provides a preliminary qualitative regulatory assessment of the proposed rulemaking and several possible alternatives:

**OPTION 1: Change the onsite and offsite insurance regulations to specify reduced requirements based on reduced risk over time after shutdown at permanently shut down reactors.**

The proposed rulemaking would codify specific onsite and offsite insurance requirements for nuclear reactor licensees that have permanently ceased operation and permanently removed fuel from the reactor vessel. The insurance requirements would vary depending on the specific configuration of the facility and the length of time since operation. The requirements would be based on the proposed rule issued on October 30, 1997, modified as appropriate to address the public comments received in response to that proposal. The changes would also clarify the definition of "rated capacity" for permanently shutdown plants. The regulatory changes would be generally consistent with current licensee insurance coverages that have been approved by the NRC staff on a case-by-case basis via the exemption process for permanently shutdown and defueled reactors.

#### **ASSESSMENT OF OPTION 1**

This rulemaking option would reduce resources expended by both the licensee and the NRC related to processing exemption requests involving insurance requirements at permanently shut down reactors. By providing a regulation that clearly specifies the minimum indemnity requirements that must be maintained at a nuclear power reactor that is permanently shutdown and defueled, licensing delays due to misinterpretation or confusion resulting from the existing regulations can be prevented. Since the purpose of this rulemaking option is to codify current exemption practices, there is no anticipated burden or increased cost associated with the proposed rulemaking beyond what is currently required at permanently shut down reactors. In order to avoid any backfit issues, licensees who, before the effective date of this rule, have certified to the NRC that they have permanently ceased operations and permanently removed fuel from the reactor vessel as specified in §50.82(a)(1), and have received NRC approval of exemption requests regarding onsite and offsite insurance requirements, would not be required to comply with this rule but could voluntarily elect to comply with the rule in lieu of the specific requirements associated with their approved exemptions.

#### **OPTION 2: No action**

This option would maintain the current wording of the regulations in effect. Plant-specific reductions in insurance requirements after permanent cessation of operation and permanent removal of fuel from the reactor would continue to be handled on a case-by-case basis by NRC review and approval of exemption requests submitted by licensees.

#### **ASSESSMENT OF OPTION 2**

The "no action" option would continue to require licensees to submit and the NRC to review and approve indemnity requirement exemption requests for all future permanently shutdown power reactors. This alternative would not result in a predictable regulatory environment since variability in exemption requests might result in differing requirements at different reactor

facilities. This alternative also results in significant burdens on licensees to submit and the NRC to review and approve the exemption requests.

**OPTION 3:** Eliminate all insurance requirements (both onsite and offsite) at permanently shutdown and defueled facilities.

This approach would eliminate any insurance requirements for permanently shut down reactors. Licensees could make business decisions regarding the level of insurance coverage desired.

### ASSESSMENT OF OPTION 3

This option would eliminate NRC involvement in onsite and offsite insurance. Licenses would make their own decisions about how much and what type of insurance to purchase. Although this option would impose the least burden on licensees, it could result in some increased risk to the public if a severe accident (such as a zirconium fire) occurred at permanently shutdown plant and resulted in damages that exceeded either the onsite or the offsite insurance coverage carried by that licensee. This option would also require Congressional action to revise the Price-Anderson Act which currently requires that Part 50 licensees must maintain some level of offsite liability insurance throughout the life of the license.

### RECOMMENDED APPROACH

Based on the potential for reduced costs, enhanced efficiency, and uniformity in the regulatory process for decommissioning nuclear power plants, OPTION 1 (as discussed above) is the recommended approach of this rulemaking plan. An example of language that would implement this option is provided at the end of this package.

## C. Safeguards

### REGULATORY ISSUE

Should the NRC relax physical security requirements of a permanently shutdown nuclear power plant while spent fuel is stored in the spent fuel pool?

### EXISTING REGULATORY FRAMEWORK

Licensees that permanently shut down their reactor and store spent fuel in the facility's spent fuel pool are required to meet the security requirements of 10 CFR 73.55 for protecting the site against the design-basis threat defined in 10 CFR 73.1(a)(1). This level of security would require a site with a permanent shutdown reactor to provide protection at the same level as that for an operating reactor site. There are no specific regulations for relaxation of physical security requirements at power reactor licensees which have certified permanent cessation of operations and permanent fuel removal from the reactor core in accordance with 10 CFR 50.82. During the reactor site decommissioning process, licensees typically submit requests for exemptions from specific regulations in 10 CFR 73.55 on the basis of a reduced risk to public health and safety

resulting from the relocation of spent fuel from the reactor to the spent fuel pool. The NRC has addressed this problem in the past by processing these exemption requests on a case-by-case basis. However, a decommissioning safeguards regulation would provide predictable physical security requirements during the decommissioning process, minimize the use of regulating by exemption, and also provide for a more consistent implementation of security regulations.

Title 10 CFR 73.51, "Physical Protection for Spent Nuclear Fuel and High-Level Radioactive Waste," addresses safeguards requirements for spent fuel stored in an Independent Spent Fuel Storage Installation (ISFSI). This ISFSI safeguards rule provides performance-based regulations specifically designed for spent fuel storage installations in dry cask containers or other storage formats. Although the ISFSI requirements are not applicable to fuel stored at decommissioning nuclear power plant SFPs, the fundamental safeguards concerns that apply to ISFSIs are very similar to those considered for safeguarding a SFP. The objective of the 10 CFR 73.51 rule was to reduce regulatory burden regarding security requirements without reducing protection levels to the public health and safety for spent fuel storage not associated with an operating reactor. The staff has the same objectives for developing a security rule for spent fuel storage at decommissioning nuclear power plants.

## **DISCUSSION**

Security regulations for nuclear power plant licensees are primarily designed to assure that the reactor and its vital support systems are adequately safeguarded from radiological sabotage. There is currently no distinction between the regulations addressing physical security requirements for operating nuclear power plant licensees and licensees that are decommissioning their plants. It has been recognized by the staff in many exemptions and related licensing actions for decommissioning plants that the scope of the physical security program for decommissioning plants, including the design and arrangement of physical barriers and detection aids, can be significantly reduced. For decommissioning plants, the target sets subject to radiological sabotage, and therefore the focus of safeguards protection, are confined to the structures, systems, and components important to maintaining the integrity of the spent fuel in the SFP. Reasonable reductions in the safeguards requirements at a decommissioning plant (relative to what is needed for a fully operational reactor) should be achievable without impacting the overall effectiveness of the safeguards program in protecting the spent fuel from radiological sabotage.

SECY-99-008 dated January 20, 1999, which was approved by the Commission in staff requirements memorandum dated June 29, 1999, proposed a rulemaking plan that would develop specific safeguards regulations for decommissioning nuclear power plants. The SECY recommended that the new regulations codify security practices that have been established for previously decommissioned plants via the exemption process. In addition, the SECY also recommended that vehicle barrier systems be maintained against vehicle-borne bombs while fuel is stored in the spent fuel pool. However, the safeguards rulemaking effort was suspended until the technical study of SFP risk was completed and the impact of zirconium fire risk on SFP security could be assessed. It was also decided that safeguards be included as part of an integrated, risk-informed decommissioning rulemaking effort.

The final draft technical study does not reach any conclusions about the overall risk of radiological sabotage of spent fuel stored in the SFP at a decommissioning plant since no established method exists estimating the likelihood of a sabotage event. The technical study does confirm that the consequences of events resulting in the drainage of a SFP can be very severe when a zirconium fire is possible. Clearly, any radiological sabotage that threatens to drain the SFP must be safeguarded against while the fuel is vulnerable to a zirconium fire. This would include the need to protect against vehicle-borne bombs which, on a site specific basis, could conceivably puncture a hole in the SFP. The SFP risk study did not assess the consequences of spent fuel pool drainage after the possibility of a zirconium fire has ceased. It is presumed that the consequence of SFP drainage without a zirconium fire would be limited to the radiological shine from the unshielded spent fuel. The offsite radiation levels from a drained SFP would have to be determined on a site-specific basis but the potential exposure of the public under such a condition would, in most cases, be minimal. However, the drainage of the SFP by an act of radiological sabotage (or any other act which could affect the integrity of the spent fuel or its support systems) is considered unacceptable from a safeguards perspective, even when the possibility of offsite consequences is greatly diminished. The recommendations in this decommissioning safeguards rulemaking plan for are devised to prevent radiological sabotage of the spent fuel from the time it is offloaded from the reactor to the time it is placed into an ISFSI. The staff does not recommend any further changes in anticipated decommissioning safeguards regulations as a result of the reduction in consequences as a function of spent fuel decay time. This would indicate the need to maintain a vehicle barrier system as long as spent fuel is stored in the SFP.

This rulemaking plan recommends that safeguards at decommissioning nuclear power plants be relaxed as soon as all spent fuel has been offloaded from the reactor to the SFP and be maintained in effect until the spent fuel is placed into an ISFSI. It is the staff's intention that the decommissioning safeguards regulations be implemented via the provisions of 10 CFR 50.54(p) and that NRC approval of the changes would not be required.

Based on the potentially severe consequences of a spent fuel pool drain-down, the staff recommends that the SFP be recognized as a vital area as supported in Part 73.2, "Definitions," (discussed further in Option 3). This may have backfit implications not only for plants currently decommissioning but for operating plants as well. The staff will perform a backfit analysis for this revised regulatory position as part of the process of issuing the proposed rule.

## **RULEMAKING OPTIONS**

**OPTION 1:** Make no modifications to the existing safeguards rules to include plants undergoing decommissioning.

An alternative to issuing a new rule or modifying the existing rule for permanently shutdown reactor sites is to continue to process licensee requests for exemptions to the existing security regulations in 10 CFR 73.55. In this process, the headquarters staff will continue to deal with each licensee that ceases operation of a power reactor on a site-specific basis. The current process of handling these cases through exemptions has involved licensee security plan revisions and staff review of those revisions.

## ASSESSMENT OF OPTION 1

This proposed option achieves operational savings for a licensee by a reduction in the existing security. However, this proposed option would continue to use licensee and staff resources to prepare and review each exemption on a case-by-case basis. Also, this proposed option would not provide predictable requirement for operating reactors as they plan for permanent shutdown, decommissioning, and spent fuel storage.

**OPTION 2:** Modify 10 CFR 73.51 to include security for spent fuel pools.

This regulatory option for security involves the endorsement of 10 CFR 73.51, Independent Spent Fuel Storage Installation (ISFSI) security, with certain additional security modifications. The most significant modification is the need for a Vehicle Barrier System at these sites to protect against incidents involving the use of an explosives-laden vehicle to create a criticality or radiological release. The staff would codify those specific concerns for permanently shutdown reactors in 10 CFR 73.55 and refer appropriate endorsement of the requirements of 10 CFR 73.51.

## ASSESSMENT OF OPTION 2

This proposed option achieves operational savings for the licensee by a reduction in the existing security of an operating reactor contained in 10 CFR 73.55 to a level of security between that of ISFSI and operating reactor. This proposed option will provide predictable requirements for operating reactors as they plan for permanent shutdown, decommissioning, and spent fuel storage.

**OPTION 3:** Develop a new regulation 10 CFR 73.XX for security at permanently shutdown power reactor sites.

This regulatory option for security involves developing a new regulation to address the appropriate level of security at permanently shutdown power reactor sites. Under this proposed rule, sites could maintain their existing plans based on 10 CFR 73.55, or they could choose the new regulations designed specifically for permanently shutdown reactor sites. This new regulation would include many aspects of the ISFSI security regulation 10 CFR 73.51 with specific modification to suit spent fuel storage in a fuel pool. If a licensee chooses to use the new security regulations, implementation could commence after certifying permanent shutdown and fuel removal from the core as specified in 10 CFR 50.82; prior NRC review and approval would not be necessary.

## ASSESSMENT OF OPTION 3

As part of this process, a licensee could choose to use the existing VBS that was in place when the reactor was still operating or could relocate or even remove the VBS pursuant to the proposed regulation, provided the licensee meets certain performance criteria, similar to language in the original VBS regulation for operating power reactors. The technical basis for a redesigned VBS would have to meet Commission design goals already established in

10 CFR 73.55(c)(8) to protect equipment, systems, devices, or material, the failure of which could directly or indirectly endanger public health and safety by exposure to radiation and criteria for protection against a land vehicle bomb. Documentation justifying modification of the VBS would have to be available to the Commission for its inspection.

This option would require the fuel be stored in a protected area. These protected areas will be monitored by periodic patrols and have intrusion detection systems. Another aspect of this option delineates the spent fuel pool as a vital area as defined in 10 CFR 73.2 Definitions: "Vital area means any area which contains vital equipment," and "Vital equipment means any equipment, system, device, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation," thus, requiring two physical barriers surrounding the spent fuel pool. This would be a policy clarification but not a change in the regulations.

As part of this process, licensees who are in the process of defueling power reactors have security programs in place and could, therefore, simply reconfigure and/or relocate the security equipment and systems to accommodate the spent fuel pool building protected area. The security program would continue to provide protection for the spent fuel; however, the program and the security areas to be protected on a continuing basis could be reduced. Cost factors would be on a site-specific basis depending on the location and relocation of existing security equipment in relation to areas of the plant that will be dismantled during the decommissioning process.

A new rule specifically written for permanently shutdown reactor sites would benefit the licensee in several ways. By reducing the size of the protected area from operating reactor size to permanently shutdown reactor size, the licensee would realize a savings in the number of security force members that are needed to protect the site. In addition, much of the original security equipment and systems would no longer need to be maintained and could be removed. The reduced size of the site would allow easier dismantling of those buildings and structures that were needed for the operating reactor site.

This proposed option will provide predictable requirements for operating reactors as they plan for permanent shutdown, decommissioning, and fuel storage.

### **RECOMMENDED APPROACH**

The staff recommends Option 3: A new rule addressing permanently shutdown reactor sites, which includes vehicle bomb protection and reduced security as appropriate with the risk of shutdown reactors. Under this option, future power reactor sites with permanently shutdown reactors will have a set of regulations specifically addressing the standards for protecting spent fuel at these sites. This option is consistent with the initial recommendations contained in SECY-99-008 rulemaking plan previously approved by the Commission. An example of language that would implement this option is provided at the end of this package.

## **D. Operator Staffing and Training**

### **REGULATORY ISSUE**

Should the NRC establish operator staffing and training requirements for permanently shutdown and defueled nuclear reactors?

### **EXISTING REGULATORY FRAMEWORK**

The operator staffing regulations in 10 CFR 50.54(m) specify the minimum licensed operator staffing levels for "operating" reactors (e.g., minimum staff per shift for licensed operators and senior operators) but do not provide any alternatives for licensees that have permanently shutdown (via docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel). For decommissioning plants, the NRC has been approving license amendments that discontinue the requirements for licensed operators and allows shift staffing consisting of a certified fuel handler (with NRC approval of the certification training program) together with an additional non-licensed operator. However, there is no regulatory basis to support these staffing requirements. Similarly, 10 CFR 50.54(i), (i-1), (k), and (l) all contain licensed operator requirements that do not apply to decommissioning plants and should be clarified.

In August 1996, a major decommissioning rule became effective that made a number of changes to 10 CFR Part 50 to simplify the decommissioning regulations. One of the changes involved the definition of the title certified fuel handler in 10 CFR 50.2. The certified fuel handler is intended to be the on-shift licensee representative who is not only responsible for safe fuel handling operations at a decommissioning plant, but is always present on shift to ensure the safe maintenance and storage of spent fuel and overall safety of any decommissioning related activities at the facility. The certified fuel handler does not need to be licensed by the NRC, but must be qualified in accordance with a certified fuel handler training program approved by the Commission. The regulatory definition does not recognize that the certified fuel handler applies only to decommissioning plants and that this operator has other responsibilities besides activities involving the handling of fuel. Similarly, the title of this operator position, "Certified Fuel Handler," implies a work scope limited to fuel handling. Therefore, revising the definition and title of the certified fuel handler should be considered to prevent future confusion regarding the role of this operator.

Training and qualification requirements for non-licensed reactor personnel are addressed in 10 CFR 50.120, "Training and qualification of nuclear power plant personnel." This section is known as the training rule. Since the training rule was implemented in November 1993, several decommissioning plant licensees have sought an exemption to permit termination of the shift technical advisor (STA) training program because the need for an STA does not exist after a reactor has permanently ceased operation. Although the staff has determined that an exemption is not required, the training regulations for decommissioning plants are not clear. In addition, 10 CFR 50.120 does not address the need for a training program for certified fuel handlers as required by the definition in 10 CFR 50.2. To eliminate the need to issue future exemptions from 10 CFR 50.120 regarding shift technical advisor training and to clarify that a



Commission approved certified fuel handler training must be established for decommissioning plants, 10 CFR 50.120 should be revised.

Title 10 CFR Part 50, Appendix A, General Design Criteria 19, provides a design basis definition of a control room for operating reactors as a room "from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents." This definition is not necessarily relevant to a decommissioning plant. During decommissioning, the control room is subject to extensive changes which are evaluated by the licensee for safety implications under the 10 CFR 50.59 process. In fact, it is current practice among some licensees to design and construct a decommissioning control station that is independent of the original operating control room. For most decommissioning plants, it can probably be demonstrated that the control room is not needed to provide a safety-significant function related to decommissioning process safety nor does it function to prevent or mitigate design basis accidents (such as radiological releases during decontaminations or dismantlement activities or spent fuel handling and storage accidents). The control room at decommissioning plants functions primarily as the command and control center for coordinating and authorizing decommissioning activities; responding to events (such as fires or radiological spills); and communicating with outside organizations (emergency response). Therefore, it should not be incumbent upon a licensee to use the operating plant control room as the control room for decommissioning if an acceptable alternative can be demonstrated (via the 10 CFR 50.59 process). In order to clarify the control room concept for decommissioning plants, a new definition for the control room should be considered.

## DISCUSSION

Nuclear power plant regulations do not address minimum operator staffing levels or training requirements for a facility undergoing decommissioning. The absence of requirements or guidance on operator staffing levels has the potential to create uncertainty as to what constitutes an acceptable minimum shift complement during any phase of decommissioning. Since most decommissioning licensees have elected to develop technical specification amendments with prescribed minimum staffing levels, lack of regulation in this area imposes a burden on both licensees and the NRC when preparing, justifying, reviewing, and evaluating operator staffing amendments or exemption requests which could be avoided if appropriate regulations existed. By codifying current regulatory practice at decommissioning plants, the efficiency and uniformity of the regulatory process for future decommissioning should be enhanced.

During decommissioning, the principal safety concern involves the storage of spent fuel in the SFP. The operational skills needed for maintaining safe storage of spent fuel are not comparable to the complexities of operating a nuclear power plant. Activities during decommissioning are not technically difficult and not appreciably different from the routine challenges faced during operating reactor maintenance outages. Overall safety at decommissioning reactors is primarily dependent on the procedural and configuration controls exercised by the licensee over often varied and unique dismantlement and decontamination activities. The staff's technical study on SFP risk at decommissioning nuclear power plants did not recommend any minimum staffing levels or training requirements inherent in supporting the risk conclusions. However, it did show that the frequency of events that could lead to a spent

fuel uncover and potential zirconium fire are significantly impacted by human error probabilities. It is the staff's judgement that this is a sufficient basis for establishing a baseline operator staffing and training level at decommissioning nuclear power plants while spent fuel is stored in the SFP.

The current regulations for operating reactors require specific staffing levels for licensed operators for each shift, as well as control room staffing requirements and commensurate training requirements for licensed operators. The regulations define the duties of licensed operators as either the manipulation of controls or supervising the manipulation of controls that directly affect the reactor reactivity or power level of the reactor. A decommissioning plant is clearly not "operating" and no manipulation of controls that affect reactor reactivity or power can occur at a permanently defueled reactor. Therefore, the regulations that require specified licensed operator staffing for operating reactors are not applicable to a decommissioning plant.

Because the decommissioning regulations are silent regarding operator staffing, licensees have been amending their defueled technical specifications to eliminate the need to maintain licensed operators on the staff. Furthermore, the associated licensed operator training programs are being discontinued for decommissioning plants (which has in some cases resulted in the licensee seeking an exemption request). In place of the licensed operators, decommissioning plant licensees have required the presence of a "Certified Fuel Handler" and a non-licensed operator as the minimum staffing for each shift. The "Certified Fuel Handler" is a new staffing position specified in the decommissioning rulemaking changes to 10 CFR Part 50 that were issued in 1996. It was the intent of that rulemaking to establish the certified fuel handler as the principle on-shift operational staff position for decommissioning plants. The on-shift certified fuel handler is expected to be cognizant of the onsite decommissioning activities and would assume the safety responsibilities for these activities, as well as spent fuel related activities. The certified fuel handler is a non-NRC licensed operator that replaces the licensed operators (i.e., SROs and ROs) of an operating reactor. Although the certified fuel handler is not licensed, the training program is reviewed and approved by the NRC. The 1996 rulemaking did not provide any details of the certified fuel handler's functions and responsibilities or directly associate the position with decommissioning activities. As a result, the staff believes that the regulatory definition of the certified fuel handler should be improved. In addition, it is the opinion of the NRC staff that the position title "Certified Fuel Handler" is a misnomer that can diminish the perception of this operator's responsibilities and duties (which involve much more than fuel handling). This proposed rulemaking would clarify the responsibilities of a certified fuel handler and rename the position.

Another staffing position required for operating reactors is the shift technical advisor (STA). The STA provides engineering expertise on shift for assisting in the diagnosis of complex structure, system, and component problems during reactor operation. This staffing requirement is not relevant to a decommissioning plant and is typically removed via license amendment from the decommissioning plant technical specifications. However, the acceptability of discontinuing the STA training program is not addressed in the current regulations and needs to be clarified.

Related to the decommissioning plant operator staffing levels is the associated control room staffing requirements. A current practice of some decommissioning plant licensees that is not addressed by the regulations is the use of an alternative to the conventional control room (as

defined in 10 CFR 50, Appendix A, General Design Criterion 19) for coordinating decommissioning activities and monitoring plant status. To prevent ambiguities related to the meaning of control room for decommissioning plants when specifying operator staffing levels, this rulemaking plan recommends a new definition of the control room that does not involve GDC-19 and should enhance licensee flexibility regarding control room staffing.

In order to ensure that an integrated approach was employed in developing this rulemaking plan, other regulations with requirements having potential relevance to decommissioning staffing and training were considered. For example, while the minimum staffing level is explicitly defined in the rulemaking plan, the recommended regulatory changes recognize that the licensee may need to have greater staffing levels to be able to respond to facility emergencies and does not undermine EP requirements for decommissioning. The staffing levels would become flexible when the spent fuel is removed from the SFP and transferred to an ISFSI so that after such time there would be no prescribed minimum staffing level. This is consistent with ISFSI requirements.

In summary, the integrated rulemaking plan will define appropriate levels of staffing, training, and qualifications, for operators at decommissioning nuclear power plants which is consistent with exemption previously granted to decommissioning plants. The recommended minimum levels of plant staffing in the rulemaking plan will also ensure that decommissioning facilities are properly maintained, systems are safely operated, and radiological activities are safely performed.

The recommendation of this rulemaking plan for operator staffing and training proposes a decommissioning rule be developed that address the following:

- Clarify that licensed operators are not required for permanently shutdown and defueled reactors.
- Clarify that a shift technical advisor (STA) training program is not required for permanently shutdown and defueled reactors.
- Clarify the responsibilities and provide a new title for the Certified Fuel Handler.
- Specify the minimum staffing level of certified operators and other non-licensed operators for permanently shutdown and defueled reactors.
- Define an alternative definition of a control room for permanently shutdown and defueled reactors.

## **RULEMAKING OPTIONS**

The following discussions provide a qualitative preliminary regulatory assessment of the staff's recommended rulemaking approach and several alternatives considered.

**OPTION 1:** Change the regulations regarding operator staffing and training for permanently shutdown and defueled reactors and clarify related definitions

This rulemaking option would establish through codification, the minimal operator staffing requirements for a nuclear reactor licensee that has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel. The rulemaking

would also specify that the training program for the shift technical advisor be discontinued for decommissioning plants. The changes would clarify the definition of the certified fuel handler and add a definition of a decommissioning control station. The regulatory changes would be consistent with current licensee practices that have been approved by the NRC staff on a case-by-case basis via licensing amendments for permanently shutdown and defueled reactors.

#### ASSESSMENT OF OPTION 1

This rulemaking option would reduce resources expended by both the licensee and the NRC related to licensing amendments involving operator staffing and training at decommissioning plants. By providing rulemaking that clearly specifies the minimal operator staffing requirements that must be maintained at a nuclear power reactor that is permanently shutdown and defueled, licensing delays due to misinterpretation or confusion as a result of the existing regulations can be prevented. Since the purpose of this rulemaking option is to codify current licensing practices, there is no anticipated burden or increased costs associated with the proposed rulemaking beyond what is currently expected of decommissioning plants. In order to avoid any backfit issues, licensees who, before the effective date of this rule, have certified to the NRC that they have permanently ceased operations and permanently removed fuel from the reactor vessel, as specified in §50.82(a)(1), would not be subject to this rule.

#### OPTION 2: No action

This option would maintain the current wording of the regulations in effect. Justification for discontinuing the training and use of licensed operators after permanent cessation of operation and removal of fuel from the reactor could be made based on a liberal interpretation that the operator staffing and training requirements of 10 CFR 50.54(i), (k), (l), and (m) as not being applicable to a decommissioning plants (consistent with current practice).

The need to revise the training requirements in 10 CFR 50.120 to remove the requirement for a shift technical advisor training program also may be unnecessary if the regulation is liberally interpreted. The regulation states that "...[t]he training program must be periodically evaluated and revised as appropriate to reflect...changes to facility, procedures, regulations..." This language is probably sufficiently broad to allow changes to the training program (as a result of a nuclear reactor being permanently shutdown and defueled) to not require an exemption to the regulations. Redefining the responsibilities of the certified fuel handler and adding a definition for the decommissioning control station are not essential for regulating decommissioning plants.

#### ASSESSMENT OF OPTION 2

The "no action" option would likely not result in any significant additional cost or burden if licensees continued to commit to staffing requirements in the decommissioning technical specifications that are consistent with current practice. However, because regulations do not require a licensee to commit to specific operator staffing levels for permanently shutdown and defueled reactors, there is certainly the possibility that future license amendments related to operator staffing could propose more relaxed operator staffing requirements than those established by current practice or, in the extreme case, propose the total elimination of any

licensing commitment for operator staffing and argue that staffing for decommissioning is beyond the purview of the NRC. This would present an unreviewed safety concern since the staff has no basis to judge that a reduction of staffing less than proposed in the current rulemaking can adequately control decommissioning activities and safely maintain storage of spent fuel in the spent fuel pool. Therefore, this option could result in a potential for increased risk to the public health and safety should a licensee deviate in a non-conservative manner from current practice.

**OPTION 3:** Provide less prescriptive requirements for operator staffing for a permanently shutdown and defueled reactor

This option would eliminate any specific operator staffing levels for decommissioning plants. Instead, the regulations could be revised to state something like: "...the licensee shall submit the operator staffing requirements of a permanently shutdown and defueled reactor to the Commission for approval as part of the decommissioning technical specifications." Regulatory guidance as to what the Commission expects for decommissioning staffing could be defined in a regulatory guide on decommissioning technical specifications.

The clarifications to the training requirements of 10 CFR 50.120 to eliminate the training program for a shift technical advisor, and the requirements of 10 CFR 50.2 clarify the responsibilities of the certified fuel handler and the decommissioning control station would still be made as proposed in OPTION 1 of this rulemaking plan.

### ASSESSMENT OF OPTION 3

This option would revise the decommissioning staffing regulations to be less prescriptive than the regulatory changes being proposed by OPTION 1. This option has some inherent advantages over OPTION 1 in that it allows greater flexibility to the licensee to address unique decommissioning situations with alternative staffing plans that have not been previously considered. This could benefit the licensee in that staffing could possibly be reduced from a minimum of two operators per shift (1 certified fuel handler and 1 non-licensed operator) to perhaps 1 operator per shift under some unforeseen circumstance. The need for this flexibility for licensees appears to be minimal based on current practice. In addition, there may be some disadvantage to the licensee in that the Commission does not necessarily have to accept a given staffing plan (even if it was consistent with OPTION 1) if the licensee's justification is judged to be insufficient. It would appear that the licensee's justification of a given staffing plan and the Commission's evaluation of that plan, could result in a possible cost burden to both the licensee and the staff if no specific regulatory basis is cited. This potential uncertainty could be offset by issuance of a staffing regulatory guide but the minimal staffing specifications acceptable to the Commission could just as easily be incorporated directly into the regulations and exemptions issued for any unanticipated conditions of decommissioning.

## RECOMMEND APPROACH

Based on the potential for reduced costs, enhanced efficiency, and uniformity in the regulatory process for decommissioning nuclear power plants, OPTION 1 (as discussed above) is the recommended approach of this rulemaking plan. An example of language that would implement this option is provided at the end of this package.

## E. Backfit

### REGULATORY ISSUE

How to apply the backfit rule, 10 CFR 109, to reactors undergoing decommissioning?

### EXISTING REGULATORY FRAMEWORK

The backfit rule, 10 CFR 50.109, was first adopted by the Atomic Energy Commission in 1970, (35 FR 5317, March 31, 1970). Because of complaints by nuclear power plant licensees that the backfit rule was ineffective, in 1983 the Commission issued a policy statement on backfitting (48 FR 44173, September 28, 1983) and began rulemaking to revise the rule. The Commission adopted a final backfit rule in 1985 (50 FR 38097, September 1985), but on appeal the U.S. Court of Appeals remanded that rule to the Commission because it failed to distinguish between "adequate protection" backfits for which costs of the backfit could not be considered under the Atomic Energy Act (AEA), versus other backfits which represented an enhancement to safety beyond what may be required for adequate protection. Union of Concerned Scientists v. NRC, 824 F.2d 103 (D.C. Cir. 1987). The Commission subsequently adopted a revised backfit rule in 1988 (53 FR 20603, June 6, 1988) which is substantially the same rule in effect today.

The backfit rule provides that, unless a backfit falls into one of three "exceptions" (listed in Section 50.109(a)(4)(i) through (ii)), the NRC may not impose a backfit on a licensee without preparing a backfit analysis which finds that there is:

a substantial increase in the overall protection of the public health and safety...to be derived from the backfit and that the direct and indirect costs of implementation for that facility are justified in view of this increased protection.

- 10 CFR 50.109(a)(3). Section 50.109(a)(1) defines a "backfit as:

the modification of or addition to systems, structures, components, or design of a facility; or the design approval or manufacturing license for a facility; or the procedures or organization required to design, construct, or operate a facility; any of which may result from a new or amended provision in the Commission rules or the imposition of a regulatory staff position interpreting the Commission rules that are either new or different from a previously applicable staff position.

NRC Manual Chapter 0514 (Management Directive 8.4), "NRC Program for Management of Plant-Specific Backfitting of Nuclear Power Plants," and Office of Nuclear Reactor Regulation

(NRR) Office Letter No. 901, "Procedures for Managing Plant-Specific Backfits and 10 CFR 50.54(f) Information Requests," define the objectives, authorities, and responsibilities and establish basic requirements for actions to be taken in instances in which the NRC imposes new plant-specific requirements on a nuclear power plant licensee. NRR Office Letter No. 500, "Procedures for Controlling the Development of New and Revised Generic Requirements for Power Reactor Licensees," establishes procedures to develop, among other things, new or revised generic staff positions or requirements for power reactor licensees while avoiding placing unnecessary burdens on licensees.

## **DISCUSSION**

The intent of the backfit rule is to protect licensees from unwarranted, costly, NRC-imposed operational and design changes and modifications that would not result in a substantial increase in the overall protection of the public health and safety or the common defense and security. The current backfit rule in section 50.109 is sufficiently narrow that one might conclude that plants undergoing decommissioning are excluded. As a result of extended decommissioning backfit claims involving Maine Yankee, the staff concluded that a backfit process and protection should apply to decommissioning facilities. The staff recommended in SECY-98-253 dated November 4, 1998, that the backfit rule apply to plants undergoing decommissioning and the Commission issued an SRM dated February 12, 1999, that accepted the staff's recommendation and directed the staff to develop a rulemaking plan.

In this integrated rulemaking plan, the staff has recommended the changes to the backfit rule that will eliminate ambiguity and clearly indicate that the rule applies to plants undergoing decommissioning in a manner similar to the way the current backfit rule applies to operating plants. In addition, the plan also recognizes that NRC administrative procedures will need to be modified to implement the appropriate regulatory guidance associated with including decommissioning plants into the backfit rule.

The technical study on SFP risk does not have any direct impact on the application of the backfit rule to decommissioning plants. However, one criteria used in performing a backfit analysis is the potential change in risk. The staff's SFP risk study does propose risk criteria for SFP accidents which can be used for the backfit test. The staff does not consider the recommended changes to the backfit rule as a backfit because it appears to comport with the exception criteria of defining or redefining what level of protection to public health and safety and common defense and security should be regarded as adequate.

Since the staff believes that a regulatory requirement analogous to the current backfit rule is necessary for plants undergoing decommissioning, an interim action is prudent until a new rule can be developed. This interim action will protect the plants undergoing decommissioning from unwarranted NRC-imposed changes in requirements during the time when the new rule is being developed. The staff will apply the current backfit rule to plants undergoing decommissioning, although the terms within the rule indicate application to operating reactors. The staff will apply the current rule to the extent practical, which includes a rigorous cost-benefit analysis for any NRC-imposed changes to the license requirements.

## **RULEMAKING OPTIONS**

The following discussions provide a qualitative preliminary regulatory assessment of the staff's recommended rulemaking approach and the alternative considered.

### **OPTION 1: Status quo.**

Make no modifications to the existing rule to include plants undergoing decommissioning. Apply the current rule as a matter of policy to plants undergoing decommissioning to the extent practical.

### **ASSESSMENT OF OPTION 1**

This option would not require any additional staff effort and is the current Commission policy, but this option would not clarify the current regulation on the applicability of backfit to plants undergoing decommissioning.

### **OPTION 2: Modify existing rules to include plants undergoing decommissioning.**

### **ASSESSMENT OF OPTION 2**

This modification would divide the current rule into two parts, operating reactors and reactors undergoing decommissioning. The operating reactor section would be changed only to accommodate the addition of the section for reactors undergoing decommissioning. The section for reactors undergoing decommissioning would have wording similar to the operating reactor section but would specifically address reactors undergoing decommissioning. The current rules would be written with a section fully devoted to operating reactors and a section devoted to decommissioning reactors. This would require the duplication of some paragraphs that apply to both, but would be less confusing on what requirements apply to decommissioning reactors. In conjunction with this effort, appropriate changes to NRC administrative procedures would be made to provide additional guidance to the staff on the application of backfit screening and analysis to decommissioning plants.

## **RECOMMEND APPROACH**

The staff recommends option 2 the development of a two sectioned rule similar to the backfit rule that will clearly apply to reactors undergoing decommissioning and operating reactors in the same manner in which the current backfit rule applies to operating reactors. In the interim, the staff will continue to apply the current backfit rule to the extent practical for NRC-imposed changes in license requirements. An example of language that would implement this option is provided at the end of this package.



## OGC ANALYSIS

The proposed rulemaking plan would address decommissioning issues that have been handled in the past by individual exemption requests. It is more appropriate to address a recurring issue by rulemaking rather than by routine exemptions. The establishment of a risk-based rules for EP, insurance, physical security, operator staffing and training, and backfit requirements that are consistent with the staff's technical on spent fuel pool accident risk at decommissioning nuclear power plants and will protect public health and safety and common defense and security while reducing the regulatory burden for the licensee. OGC has not identified any basis for a legal objection to the rulemaking plan.

OGC has not identified any Paperwork Reduction Act issues. OGC does not believe that this action constitutes a "major rule" pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, but, in accordance with EDO guidance, the rulemaking proposal will be submitted to OMB for verification of this position at the earliest point that sufficient information is available on which OMB can render its decision on NRC's determination.

*n* ~~OGC does not believe that the proposed rule~~ to be developed based on this rulemaking plan will not require a backfit analysis under 10 CFR 50.109 (with a possible exception as noted below). The proposed rule changes could be viewed as a voluntary relaxation, since it appears that licensees could continue to maintain their existing EP, insurance, physical security, staffing requirements, and backfit policy and be in compliance with the proposed changes recommended in this rulemaking plan. As such, if licensees are not compelled to change their existing programs, then there is no "imposed change" constituting a backfit as defined in Section 50.109(a)(1). Alternatively, the proposed rule changes would appear to fall within the exception in Section 50.109(a)(4)(iii) with respect to "defining or redefining what level of protection to public health and safety and common defense and security should be regarded as adequate." One possible exception to this conclusion is a policy clarification of classifying a spent fuel pool as a vital area may have backfit implications. If it is determined to be a backfit, and appropriate backfit analysis will be provided with the proposed rule. The current requirements identified in this rulemaking plan in 10 CFR Parts 50, 73, and 140 are considered to be necessary for adequate protection to public health and safety, but make no distinction between operating reactors and permanently shutdown reactors. The changes being contemplated to that section would redefine (by relaxing) those requirements for permanently shutdown plants. *?*

As the rulemaking plan points out, the rulemaking will require a regulatory analysis. In addition, the staff must prepare an environmental assessment pursuant to 10 CFR 51.21. Unless an option is chosen which requires Congressional revision of the Price-Anderson Act, OGC has not identified any potential legal complications or known bases for a legal objection to the proposed rulemaking.

## BACKFIT ANALYSIS

The proposed rulemaking should not require a backfit analysis (with the possible exception discussed below) because it complies with the exception criterion of 10 CFR 50.109(a)(4)(iii) in that the rulemaking results in "defining or redefining what level of protection to public health and safety and common defense and security should be regarded as adequate." The staff will

prepare a documented evaluation justifying this conclusion. There is a recommendation in this rulemaking plan that the spent fuel pool be considered a vital area. This is a change from the previous general position that the staff has taken on spent fuel pools and may have backfit implications for both operating and decommissioning plants. The staff may need to perform a backfit analysis to justify this change in policy position.

### COMPATIBILITY OF AGREEMENT STATE REGULATIONS

Under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs" approved by the Commission on June 30, 1997, and published in the *Federal Register* September 3, 1997 (62 FR 46517), Sections 50.54, 50.47, and Appendix E (for EP), Section 140.11 (Insurance), Part 73 (Safeguards), Section 50.120 (Operator Staffing and Training), and Section 50.109 (Backfit) are classified as compatibility category "NRC." The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the AEA or provisions of Title 10 of the Code of Federal Regulations.

### SUPPORTING DOCUMENTS

The rulemaking to be developed from the recommended approaches in this plan would require a detailed regulatory analysis that the staff believes would show a benefit to licensees with no significant impact to the environment or public health and safety. No backfit analysis is anticipated (with a possible exception as noted below) but a documented evaluation will be prepared justifying this conclusion. The plan may involve changes in information collection requirements that may require submission to the Office of Management and Budget (OMB) to determine if a full review is required. If a full OMB review is required, an OMB clearance package will be submitted at the same time the proposed rule is forwarded to the *Federal Register* for publication. An Environmental Assessment would be necessary to demonstrate that there are no significant impacts to the environment and public health and safety.

The staff will need to develop a regulatory guide for performing T-H analyses to establish that spent fuel stored in a SFP is no longer vulnerable to a zirconium fire. In addition, the staff may need to develop a regulatory guide on ways to minimize the risk of SFP accidents at decommissioning reactors and as well as guidance on performing a seismic robustness evaluation of a SFP.

The staff may need to perform a backfit analysis on a potential policy change regarding the interpretation of a SFP as a vital area.

NRC Manual Chapter 0514, NRR Office Letter No. 901, and NRR Office Letter No. 500 would need to be revised to provide additional guidance on implementing the backfit rule to decommissioning plants.

### SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT

In accordance with the Small Business Regulatory Enforcement Fairness Act of 1996, the NRC believes that this action is not a "major rule" and, prior to issuing the proposed rule, will verify this with the Office of Information and Regulatory Affairs, Office of Management and Budget.

## RESOURCES

The resource estimate to complete this rulemaking is approximately 6 FTE ( 1.5 FTE in FY 2000, 2.5 FTE in FY 2001 and 2 FTE in 2002) which is available within the current budget. In addition, 250K in contractor support is anticipated which will need to be reprogrammed.

## LEAD OFFICE STAFF AND STAFF FROM SUPPORTING OFFICES

### Lead Office - Project Management

NRR - Bill Huffman  
Richard Dudley  
Phil Ray

### Support Offices

NRR -Robert Skelton  
NRR -Daniel Barss  
NRR -Richard Pelton  
NRR -Ira Dinitz  
NRR -George Mencinskiy  
OGC -Stephen Lewis  
ADM - David Meyer

## STEERING GROUP

None. This rulemaking effort would not be expected to benefit from the use of a steering group.

## ENHANCED PUBLIC PARTICIPATION

This rulemaking plan and any subsequent published proposed rule will be placed in the NRC's rulemaking website. Use of this website allows users to submit comments electronically as well as review comments submitted by others.

## EDO OR COMMISSION ISSUANCE

This rulemaking will be issued by the Commission.

SCHEDULE

TAC No. MA7146

Last Update: 3/31/00

Lead Division: DLPM (RM#547)

WITS #199900072

MILESTONE	DATE (T/C)	MILESTONE	DATE(T/C)
1. New Rulemaking Plan for Commission/EDO Approval	6/30/00T	9. Public Comment	8/15/01T
2. Proposed Rulemaking Package	12/30/00T	10. Revise Rulemaking Package	11/1/01T
3. Office Concurrences [NRR/NMSS/OGC/ADM]	1/30/01T	11. Office Concurrences [NRR/NMSS/OGC/ADM]	12/15/01T
4. ACRS Comments	N/A	12. ACRS Comments	1/30/02T
5. CRGR Concurrence	2/30/01T	13. CRGR Concurrence	2/30/02T
6. EDO Concurrence	3/15/01T	14. EDO Concurrence	3/30/02T
7. Commission Approval	4/30/01T	15. Commission Approval	5/15/02T
8. Publish Proposed Rule	5/15/01T	16. Publish Final Rule	6/1/02T

Note: 7 - 14 days are required for OMB to determine if a full OMB review is required. If a full OMB review is required, an OMB clearance package will be submitted to OMB at the same time the proposed rule is forwarded to the *Federal Register* for publication.

## APPENDICES

**Examples to regulatory language which could be used to  
implement the staff's recommendations in the rulemaking plan**

**A Example Regulatory Language for EP at Decommissioning Plants**

(Changes from existing language are indicated by redlines and strikeouts)

**PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES**

1. In § 50.47, paragraph (e) and (f) are added to read as follows:

**§ 50.47 Emergency plans.**

(d) \* \* \*

(e) For a nuclear power reactor that is permanently shutdown in accordance with 10 CFR 50.82(a), and is not located on the site of a nuclear power reactor having an operating licensee, and meets the Conditions of License found in 10 CFR 50.54(gg)(ii), the onsite and offsite emergency response plans must meet the following standards:

(1) Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

(2) On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.

(3) Arrangements for requesting and effectively using assistance resources have been made, and other organizations capable of augmenting the planned response have been identified.

(4) A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

(5) Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow up messages to response organizations and the public has been established; and means to provide notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone (EPZ) have been established.

(6) Provisions exist for communications among principal response organizations to emergency personnel and to the public.

(7) Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

(8) Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

(9) Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

(10) A range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.

(11) Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

(12) Arrangements are made for medical services for contaminated injured individuals.

(13) General plans for recovery and reentry are developed.

(14) Prior to a change from the emergency planning requirements of 10 CFR 50.47(b), and biennially thereafter, an exercise will be conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

(15) Radiological emergency response training is made available to those who may be called on to assist in an emergency.

(16) Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

(f) For a nuclear power reactor that is permanently shutdown in accordance with 10 CFR 50.82(a), and is not located on the site of a nuclear power reactor having an operating license, and meets the Conditions of License found in 10 CFR 50.54(gg)(iii) or (vi), the onsite emergency plan must include the following information:

- (1) Facility description. A brief description of the licensee's facility and area near the site.
- (2) Types of accidents. An identification of each type of radioactive materials accident.
- (3) Classification of accidents. A classification system for classifying accidents as "alerts."
- (4) Detection of accidents. Identification of the means of detecting an accident condition.
- (5) Mitigation of consequences. A brief description of the means of mitigating the consequences of each type of accident, including those provided to protect workers onsite, and a description of the program for maintaining the equipment.
- (6) Assessment of releases. A brief description of the methods and equipment to assess releases of radioactive materials.
- (7) Responsibilities. A brief description of the responsibilities of licensee personnel should an accident occur, including identification of personnel responsible for promptly notifying offsite response organizations and the NRC; also responsibilities for developing, maintaining, and updating the plan.
- (8) Notification and coordination. A commitment to and a brief description of the means to promptly notify offsite response organizations and request offsite assistance, including medical assistance for the treatment of contaminated injured onsite workers when appropriate. A control point must be established. The notification and coordination must be planned so that unavailability of some personnel, parts of the facility, and some equipment will not prevent the notification and coordination. The licensee shall also commit to notify the NRC operations center immediately after notifications of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency. These reporting requirements do not supersede or release licensees of complying with the requirements under the Emergency Planning and Community Right-To-Know Act of 1986, Title III, Pub. L. 99-499 or other State or Federal reporting requirements.
- (9) Information to be communicated. A brief description of the types of information on facility status; radioactive releases; and recommended protective actions, if necessary, to be given to offsite response organizations and to the NRC.
- (10) Training. A brief description of the training the licensee will provide workers on how to respond to an emergency and any special instructions and orientation tours the licensee would offer to fire, police, medical and other emergency personnel.



(11) Safe condition. A brief description of the means of restoring the facility to a safe condition after an accident.

(12) Exercises. (i) Provisions for conducting semiannual communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Radiological/Health Physics, Medical, and Fire drills shall be conducted annually. Semiannual communications checks with offsite response organizations must include the check and update of all necessary telephone numbers. The licensee shall invite offsite response organizations to participate in the biennial exercise.

(ii) Participation of offsite response organizations in biennial exercises, although recommended, is not required. Exercises must use scenarios not known to most exercise participants. The licensee shall critique each exercise using individuals not having direct implementation responsibility for conducting the exercise. Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response. Deficiencies found by the critiques must be corrected.

(13) Hazardous chemicals. A certification that the licensee has met its responsibilities under the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Pub. L. 99-499, with respect to hazardous materials at the facility.

(14) Comments on Plan. The licensee shall allow the offsite response organizations expected to respond in case of an accident 60 days to comment on the initial submittal of the licensee's emergency plan before submitting it to NRC. Subsequent plan changes need not have the offsite comment period unless the plan changes affect the offsite response organizations. The licensee shall provide any comments received within the 60 days to the NRC with the emergency plan.

(15) Offsite assistance. The applicant's emergency plans shall include a brief description of the arrangements made for requesting and effectively using offsite assistance on site and provisions that exist for using other organizations capable of augmenting the planned onsite response.

(16) Arrangements made for providing information to the public.

2. In § 50.54, paragraph (q) is revised to read as follows:

§ 50.54 Conditions of licenses.

\* \* \* \* \*

(q) A licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans that meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E of this part. A licensee authorized to possess and/or operate a research reactor or a fuel facility shall follow and maintain in effect emergency plans that meet

the requirements in Appendix E to this part. However, if all nuclear power reactors on a site are permanently shutdown and the licensee has certified, in accordance with §50.82(a) of this part, that it has permanently ceased facility operation(s), the permanently shutdown and defueled nuclear power reactor site may elect to comply with the emergency planning requirements as specified in 10 CFR 50.54(gg) when the specific conditions are met. The licensee shall retain the emergency plan and each change that decreases the effectiveness of the plan as a record until the Commission terminates the license for the nuclear power reactor. The nuclear power reactor licensee may make changes to these plans without Commission approval only if the changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the standards of 10 CFR 50.47(b), or 10 CFR 50.47(e), or 10 CFR 50.47(f), and the requirements of Appendix E to this part, as applicable. The research reactor and/or the fuel facility licensee may make changes to these plans without Commission approval only if these changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the requirements of Appendix E to this part. A nuclear power reactor, including a permanently shutdown reactor, research reactor, or fuel facility licensee shall retain a record of each change to the emergency plan made without prior Commission approval for a period of three years from the date of the change. Proposed changes that decrease the effectiveness of the approved emergency plans may not be implemented without application to and approval by the Commission. However, when applicable, the permanently shutdown and defueled nuclear power reactor licensee may make a change in the emergency plans from the requirements of 10 CFR 50.47(b) and Appendix E to the requirements as specified in 10 CFR 50.54(gg) without prior approval from the Commission. The licensee shall submit, as specified in §50.4, a report of each proposed change for approval. If a change is made without approval, the licensee shall submit, as specified in §50.4, a report of each change within 30 days after the change is made.

3. In § 50.54, paragraph (gg) is added to read as follows:

§ 50.54 Conditions of licenses.

\* \* \* \* \*

(ff) \* \* \*

(gg) A decommissioning nuclear power reactor licensee that has docketed certifications or permanent cessation of operation and permanent removal of fuel from the reactor vessel in accordance with the requirements of 10 CFR 50.82(a) shall maintain the following applicable emergency planning requirements:

(i) For decommissioning nuclear power reactors where spent fuel stored in the spent fuel pool has less than 12 months decay time, the licensee shall follow and maintain in effect emergency plans that meet the standards in 10 CFR 50.47(b) and the applicable requirements in Appendix E of this part as specified in paragraph (q) for a licensee authorized to possess and operate a nuclear power reactor.

(ii) For decommissioning nuclear power reactors where spent fuel stored in the spent fuel pool has more than 12 months and less than 60 months decay time, the licensee may follow and

maintain in effect emergency plans that meet the standards in 10 CFR 50.47(e) and the applicable requirements in Appendix E of this part. The licensee may make a one time change in the emergency plans from the requirements of paragraph (q), to the requirements in 10 CFR 50.47(e) without prior approval from the Commission provided the following risk reduction measures are addressed in the final safety analysis report for decommissioning:

- (a) Cask drop analyses will be performed or single failure proof cranes will be in use for handling of heavy loads
- (b) Procedures and training to ensure that onsite and offsite resources can be brought to bear during an event.
- (c) Communication between onsite and offsite organizations during severe weather and seismic events.
- (d) An offsite resource plan which includes access to portable pumps and emergency power to supplement on site resources.
- (e) Readouts and alarms in the decommissioning control station for spent fuel pool temperature, water level, and area radiation levels.
- (f) Assessment of spent fuel pool seals that could cause leakage leading to fuel uncover in the event of seal failure.
- (g) Controls to reduce the likelihood of rapid drain down events including (1) prohibitions on the use of pumps that lack adequate siphon protection, (2) controls for pump suction and discharge points, (3) surveillance of the functionality of anti-siphon devices.
- (h) An onsite restoration plan spent fuel pool cooling system repair and remote access for make-up water to the spent fuel pool.
- (i) Controls for spent fuel pool operations or area activities that have the potential to rapidly decrease spent fuel pool inventory.
- (j) Testing and availability controls for alternative fuel pool make-up systems.
- (k) Shiftly SFP and support systems surveillances.
- (l) Verification of SFP seismic robustness.
- (m) Surveillance and monitoring program of Boraflex in high density spent fuel racks.

(iii) For decommissioning nuclear power reactors where spent fuel stored in the spent fuel pool has more than 60 months decay time, and/or while there is radioactive material on site, other than the spent fuel, in excess of the quantities in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for

Response to a Release," the licensee shall do a site specific evaluation showing that the maximum dose to a person offsite due to a release of radioactive material would not exceed 1 rem total effective dose equivalent or 5 rems committed effective dose equivalent to the thyroid. When the site specific evaluation result in doses that are less than 1 rem total effective dose equivalent and 5 rems committed effective dose equivalent to the thyroid at the site boundary, the emergency planning requirements at the site are as specified in 10 CFR 50.47(f). The licensee may make a one time change in the emergency plans from the requirements of paragraph (q), or 10 CFR 50.47(e), as applicable, to the requirements in 10 CFR 50.47(f) without prior approval from the Commission.

One or more of the following factors may be used to support an evaluation submitted under paragraph (iii) of this section:

- a. The radioactive material is physically separated so that only a portion could be involved in an accident;
- b. All or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;
- c. The release fraction in the respirable size range would be lower than the release fraction shown in 10 CFR 30.72 due to the chemical or physical form of the material;
- d. The solubility of the radioactive material would reduce the dose received;
- e. Facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in 10 CFR 30.72;
- f. Operating restrictions or procedures would prevent a release fraction as large as that shown in 10 CFR 30.72; or
- g. Other factors appropriate for the specific facility.

(iv) If all fuel has been stored in an independent spent fuel storage installation (ISFSI), located on or adjacent to the reactor site, that is licensed in accordance with 10 CFR 72 and a site specific analysis, of the radioactive material onsite other than the spent fuel, result in doses that are less than 1 rem total effective dose equivalent or 5 rems committed effective dose equivalent to the thyroid at the site boundary, the emergency plan required by 10 CFR 72.32 shall be deemed to satisfy the requirements of this section.

(v) For decommissioning nuclear power reactors, if there is no spent fuel stored on the site and radioactive material is stored onsite but off-site doses in the event of a radiological accident would not exceed 1 rem total effective dose equivalent or 5 rems committed effective dose equivalent to the thyroid, or the site inventory of radioactive material is below the quantities specified in 10 CFR 30.72 "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," no offsite emergency planning is required.

(vi) At the licensee discretion, for decommissioning nuclear power reactors with spent fuel is stored in the spent fuel pool, instead of waiting the required 12 or 60 months of decay time to elapse, as specified in paragraphs (i), (ii), and (iii) above, a site specific T-H analysis may be performed to determine the decay time needed to ensure that in the event of an accidental loss of cooling, including draining, of the spent fuel pool and the failure to restore cooling, doses at the site boundary are less than 1 rem total effective dose equivalent and 5 rems committed effective dose equivalent to the thyroid. After this site specific decay time has passed and no

other accidents involving the release of radioactive material are postulated that could result in doses exceeding 1 rem total effective dose equivalent or 5 rems committed effective dose equivalent to the thyroid at the site boundary, the emergency planning requirements at the site are as specified in 10 CFR 50.47(f).

4. In Appendix E to 10 CFR Part 50, Paragraph IV is revised to read as follows:

Appendix E To 10 CFR Part 50 - Emergency Planning And Preparedness For Production And Utilization Facilities

\* \* \* \* \*

(d) Content Of Emergency Plans for Facilities Licensed in accordance with 10 CFR 50.54(q)

5. In Appendix E to 10 CFR Part 50, a new Paragraph V is added to read as follows:

V Content of Emergency Plans for Permanently Shutdown and Defueled Nuclear Power Reactor Licensees in accordance with 10 CFR 50.54(gg)(ii)

The licensee's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, i.e., organization for coping with radiation emergencies, assessment action, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, and recovery. In addition, the emergency response plans submitted by a licensee of a nuclear power reactor licensed in accordance with 10 CFR 50.54(gg)(ii) shall contain information needed to demonstrate compliance with the standards described in §50.47(e), and they will be evaluated against those standards.

*A. Organization*

The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for notification of such individuals in the event of an emergency. Specifically, the following shall be included:

1. A description of the normal operating organization.
2. A description of the onsite emergency response organization with a detailed discussion of:
  - a. Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;
  - b. Onsite staff emergency assignments;

c. Authorities, responsibilities, and duties of an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.

3. A description, by position and function to be performed, of the licensee's personnel who will augment the onsite emergency organization.

4. Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.

5. A description of the local offsite services to be provided in support of the licensee's emergency organization.

6. Identification of, and assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies.

7. Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.

#### *B. Assessment Actions*

The means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on onsite conditions and instrumentation in addition to onsite and offsite monitoring. These emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities. They shall also be reviewed with the State and local governmental authorities on an annual basis.

#### *C. Activation of Emergency Organization*

The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency), for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG - 0654; FEMA - REP - 1.

*D. Notification Procedures*

1. Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.<sup>(1)</sup>
2. Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.
3. A licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency.

*E. Emergency Facilities and Equipment*

Adequate provisions shall be made and described for emergency facilities and equipment, including:

1. Equipment at the site for personnel monitoring;
2. Equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment;
3. Facilities and supplies at the site for decontamination of onsite individuals;
4. Facilities and medical supplies at the site for appropriate emergency first aid treatment;
5. Arrangements for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site;
6. Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary;
7. Arrangements for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary;
8. A licensee onsite emergency response facility, and a backup facility, from which effective direction can be given and effective control can be exercised during an emergency;
9. At least one onsite and one offsite communications system; each system shall have a backup power source.

All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication. Where consistent with the function of the governmental agency, these arrangements will include:

- a. Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested quarterly.
- b. Provision for communications with Federal emergency response organizations. Such communications systems shall be tested annually.
- c. Provision for communications among the onsite emergency response facility, the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.
- d. Provisions for communications by the licensee with NRC Headquarters from the onsite emergency response facility. Such communications shall be tested quarterly.

*F. Training.*

1. The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel:

- i. Directors and/or coordinators of the onsite emergency organization;
- ii. Personnel responsible for accident assessment, including shift personnel;
- iii. Radiological monitoring teams;
- iv. Fire control teams (fire brigades);
- v. Repair and damage control teams;
- vi. First aid and rescue teams;
- vii. Medical support personnel;
- viii. Security personnel.

In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.



2. The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, and ensure that emergency organization personnel are familiar with their duties.<sup>(3)</sup>

a. An exercise which tests as much of the licensee, State and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted. This exercise shall be conducted within three months prior to the plans implementation. Participation by each State and local government within the plume exposure pathway EPZ, although recommended, is not required.

b. Each licensee at each site shall conduct an exercise of its onsite emergency plan every 2 years. In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, protective action decision making, and system repair and corrective actions. During these drills, supervised instruction would be permitted, and the drills could focus on onsite training objectives.

c. Licensees shall enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.

d. All training, including exercises, shall provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified shall be corrected.

#### *G. Maintaining Emergency Preparedness*

Provisions to be employed to ensure that the emergency plan, its implementing procedures, and emergency equipment and supplies are maintained up to date shall be described.

#### *H. Recovery*

Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate shall be described.

6. In Appendix E to 10 CFR Part 50, Paragraph V is renumbered as Paragraph VI as follows:

#### VI. Implementing Procedures

**B. Example Regulatory Language for Insurance at Decommissioning Plants**

(Changes from existing language are indicated by redlines and strikeouts)

**PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES**

In § 50.54(w), paragraph (5) is added to read as follows:

§ 50.54 Conditions of licenses.

\* \* \* \* \*

(w) \* \* \*

(5) Notwithstanding paragraph (w)(1) above, a nuclear power reactor licensee who has permanently ceased operation and permanently removed fuel from the reactor vessel and has made the certifications in accordance with the requirements of 10 CFR 50.82(a)(1), may reduce its insurance coverage as specified below when the following conditions are met:

(i) For nuclear power reactors, while fuel is stored in the spent fuel pool, if the reactor has been shut down less than 60 months, or there is radioactive material other than spent fuel in excess of the quantities in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," on site which, due to a reasonably conceivable accident, could cause a maximum dose to a person offsite to exceed a total effective dose equivalent (TEDE) of 1 rem or a committed dose equivalent (CDE) to the thyroid of 5 rems, insurance coverage must remain as specified in paragraph (w)(1).

(ii) For nuclear power reactors, while fuel is stored in the spent fuel pool, and after the reactor has been shut down 60 months or more or while there is radioactive material other than spent fuel in excess of the quantities in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," on site, the licensee may perform a site specific evaluation intended to show that the maximum dose to a person offsite due to a reasonably conceivable accidental release of radioactive material other than the spent fuel would not exceed a TEDE of 1 rem or a CDE to the thyroid of 5 rems. When the site specific evaluation results in doses that are less than the 1 rem and 5 rem values at the site boundary, insurance requirements at the site may be reduced to a minimum insurance coverage of \$25 million. At the licensee's discretion, instead of waiting the required 60 months, a site specific thermal-hydraulic analysis may be performed to determine whether accidental draining of the spent fuel pool and the failure to restore coolant would result in doses to a person at the site boundary that are less than a TEDE of 1 rem and a CDE to the thyroid of 5 rems. When the site specific thermal-hydraulic analysis and the analysis of other reasonably conceivable accidents involving the release of non-fuel radioactive material result in doses that do not exceed the 1 rem or 5 rem values at the site boundary, site insurance coverage may be reduced to \$25 million.

One or more of the following factors may be used to support an evaluation of non-fuel radioactive material release accidents performed under this section:

- a. The radioactive material is physically separated so that only a portion could be involved in an accident;
- b. All or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;

- c. The release fraction in the respirable size range would be lower than the release fraction shown in 10 CFR 30.72 due to the chemical or physical form of the material;
- d. The solubility of the radioactive material would reduce the dose received;
- e. Facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in 10 CFR 30.72;
- f. Operating restrictions or procedures would prevent a release fraction as large as that shown in 10 CFR 30.72; or
- g. Other factors appropriate for the specific facility.

(iii) For nuclear power reactors, if there is no spent fuel stored on the site (other than in an independent spent fuel storage installation) and radioactive material is stored onsite but offsite doses in the event of a reasonably conceivable radiological accident would not exceed a TEDE of 1 rem or a CDE to the thyroid of 5 rems, or the site inventory of radioactive material is below the quantities specified in 10 CFR 30.72 "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," no onsite insurance coverage is required.

(iv) The licensee of a permanently shutdown nuclear power reactor who has requested an exemption from §50.54 (w) prior to *[insert effective date of this rule]*, may comply with either the conditions of the exemption as approved by the NRC or the requirements §50.54 (w) (5) above.

\* \* \* \* \*

#### PART 140--FINANCIAL PROTECTION REQUIREMENTS AND INDEMNITY AGREEMENTS

In § 140.11(a), remove "and" at the end of paragraph (3), change "." at end of paragraph (4) to "; and" and add paragraph (5) to read as follows:

##### § 140.11 Amounts of financial protection for certain reactors.

(a) \* \* \*

(5) The licensee of a nuclear power reactor that has permanently ceased operation and from which fuel has been permanently removed from the reactor vessel in accordance with the requirements of 10 CFR 50.82(a), (such reactors are classified in this section as having zero (0) rated capacity for electric power), may reduce its financial protection notwithstanding paragraph (a)(4) of this section when the following conditions are met, to maintain the following applicable financial protection requirements:

(i) For nuclear power reactors, while fuel is stored in the spent fuel pool, if the reactor has been shut down less than 60 months or there is radioactive material on site other than spent fuel in excess of the quantities in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," that could cause the maximum dose to a person offsite due to a reasonably conceivable accident to exceed a total effective dose equivalent (TEDE) of 1 rem or a committed dose equivalent (CDE) to the thyroid of 5 rems, financial protection requirements remain as specified in paragraph (a)(4).

(ii) For nuclear power reactors, while fuel is stored in the spent fuel pool, and after the reactor has been shut down 60 months or more or while there is radioactive material on site, other than the spent fuel, in excess of the quantities in 10 CFR 30.72, "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," the licensee may do a site specific evaluation to show that the maximum dose to a person offsite due to a reasonably conceivable accidental release of

radioactive material other than the spent fuel would not exceed a TEDE of 1 rem or a CDE to the thyroid of 5 rems. When the site specific evaluation results in doses that are less than the 1 rem and 5 rem values at the site boundary, the financial protection requirements at the site may be reduced to \$100 million per site and the licensee is no longer required to participate in secondary financial protection under an industry retrospective rating plan. At the licensee's discretion, instead of waiting the required 60 months, a site specific thermal-hydraulic analysis may be performed to determine whether accidental draining of the spent fuel pool and the failure to restore coolant would result in doses to a person at the site boundary that are less than a TEDE of 1 rem and a CDE to the thyroid of 5 rems. When the site specific thermal-hydraulic analysis and the analysis of other reasonably conceivable accidents involving the release of non-fuel radioactive material result in doses that do not exceed the 1 rem or 5 rem values at the site boundary, financial protection at the site may be reduced to the amount of \$100 million per site and the licensee is not required to participate in secondary financial protection under an industry retrospective rating plan.

One or more of the following factors may be used to support an evaluation of non-fuel radioactive material release accidents performed under this section:

- a. The radioactive material is physically separated so that only a portion could be involved in an accident;
- b. All or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;
- c. The release fraction in the respirable size range would be lower than the release fraction shown in 10 CFR 30.72 due to the chemical or physical form of the material;
- d. The solubility of the radioactive material would reduce the dose received;
- e. Facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in 10 CFR 30.72;
- f. Operating restrictions or procedures would prevent a release fraction as large as that shown in 10 CFR 30.72; or
- g. Other factors appropriate for the specific facility.

(iii) For nuclear power reactors, where there is no spent fuel stored on the site (other than in an independent spent fuel storage installation) and radioactive material is stored onsite but offsite doses in the event of a reasonably conceivable radiological accident would not exceed a TEDE of 1 rem or a CDE to the thyroid of 5 rems, or the site inventory of radioactive material is below the quantities specified in 10 CFR 30.72 "Schedule C - Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Response to a Release," financial protection at the site may be reduced to the amount of \$25 million per site and the licensee is not required to participate in secondary financial protection under an industry retrospective rating plan.

(iv) The licensee of a permanently shutdown nuclear power reactor who has requested an exemption from §140.11 prior to *[insert effective date of this rule]*, may comply with either the conditions of the exemption as approved by the NRC or the requirements §140.11 (5) above.

### C. Example Regulatory Language for Security at Decommissioning Plants

(Changes from existing language are indicated by redlines and strikeouts)

§73.XX Requirements for physical protection of licensed activities at defueled power reactor sites for protection of spent fuel against radiological sabotage.

As of the effective date of this rule, any power reactor site complying with 10 CAR 50.82(a) regarding cessation of operations may elect to modify the safeguards requirements for the site by complying with the regulation of this section in lieu of Section 73.55. This modification may be performed without prior Commission approval. Any power reactors sites implementing this section shall submit proposed revisions to its operating power reactor security plan which defines how the requirements of this section will be met and 120 days prior to implementation incorporate into the physical security plan. Submissions may be made under the provisions of 10 CAR 50.54(p). The safeguards requirements of the security plan must be inspectable by the Commission 30 days prior to implementation.

~~By Dec. 2, 1986 each licensee, as appropriate, shall submit proposed amendments to its security plan which define how the amended requirements of paragraphs (a), (d)(7), (d)(9), and (e)(1) will be met. Each submittal must include a proposed implementation schedule for Commission approval. The amended safeguards requirements of these paragraphs must be implemented by the licensee within 180 days after Commission approval of the proposed security plan in accordance with the approved schedule.~~

(a) General performance objective and requirements. The licensee shall establish and maintain an onsite physical protection system and security organization which will have as its objective to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. The physical protection system shall be designed to protect against the design basis threat of radiological sabotage as stated in Sec. 73.1(a). To achieve this general performance objective, the onsite physical protection system and security organization must include, but not necessarily be limited to, the capabilities to meet the specific requirements contained in paragraphs (b) through (h) of this section. The Commission may authorize an applicant or licensee to provide measures for protection against radiological sabotage other than those required by this section if the applicant or licensee demonstrates that the measures have the same high assurance objective as specified in this paragraph and that the overall level of system performance provides protection against radiological sabotage equivalent to that which would be provided by paragraphs (b) through (h) of this section and meets the general performance requirements of this section. Specifically, in the special cases of licensed operating reactors with an adjacent defueled reactor power plant under construction, the licensee shall provide and maintain a level of physical protection of the operating reactor against radiological sabotage equivalent to the requirements of this section such that the requirements of this section do not negatively impact the operating reactor site. In accordance with Section 50.54(x) and (y) of part 50, the licensee may suspend any safeguards measures pursuant to Sec. 73.55 in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical specification that can provide adequate or equivalent protection is immediately apparent. This suspension must be approved as a minimum by a certified fuel handler licensed senior operator prior to taking the action. The suspension of safeguards measures must be reported in

accordance with the provisions of Sec. 73.71. ~~Reports made under §50.72 need not be duplicated under §73.74~~

(b) Physical Security Organization. (1) The licensee shall establish a security organization, including guards, to protect his facility against radiological sabotage. If a contract guard force is utilized for site security, the licensee's written agreement with the contractor that must be retained by the licensee as a record for the duration of the contract will clearly show that:

(i) The licensee is responsible to the Commission for maintaining safeguards in accordance with Commission regulations and the licensee's security plan,

(ii) The NRC may inspect, copy, and take away copies of all reports and documents required to be kept by Commission regulations, orders, or applicable license conditions whether the reports and documents are kept by the licensee or the contractor,

(iii) The requirement in paragraph (b)(4) of this section that the licensee demonstrate the ability of physical security personnel to perform their assigned duties and responsibilities, includes demonstration of the ability of the contractor's physical security personnel to perform their assigned duties and responsibilities in carrying out the provisions of the security plan and these regulations, and

(iv) The contractor will not assign any personnel to the site who have not first been made aware of these responsibilities.

(2) At least one full time member of the security organization who has the authority to direct the physical protection activities of the security organization shall be onsite at all times.

(3) The licensee shall have a management system to provide for the development, revision, implementation, and enforcement of security procedures. The system shall include:

(i) Written security procedures that document the structure of the security organization and detail the duties of guards or watchmen. ~~Other individuals may be assigned specific security duties if they meet the requirements of paragraphs (b)(4).~~ The licensee shall maintain a copy of the current procedures as a record until the Commission terminates each license for which the procedures were developed and, if any portion of the procedure is superseded, retain the superseded material for three years after each change.

(ii) Provision for written license management approval of these procedures and any revisions to the procedures by the individual with overall responsibility for the security functions. The licensee shall retain each written approval as a record for three years from the date of the approval.

(4)(i) The licensee may not permit an individual to act as a guard or watchman, ~~armed response person,~~ unless the individual has been trained, equipped, and qualified to perform each assigned security job duty in accordance with appendix B, "General Criteria for Security Personnel," to this part. Upon the request of an authorized representative of the Commission, the licensee shall demonstrate the ability of the physical security personnel to carry out their assigned duties and responsibilities. Each guard or watchman, ~~armed response person,~~ shall requalify in accordance with Appendix B to this part at least every 12 months. This requalification must be documented. The licensee shall retain the documentation of each requalification as a record for three years after the requalification.

(ii) Each licensee shall establish, maintain, and follow an NRC-approved training and qualifications plan outlining the processes by which guards or watchmen, ~~armed response persons,~~ will be selected, trained, equipped, tested, and qualified to ensure that these individuals meet the requirements of this paragraph. The licensee shall maintain the current training and qualifications plan as a record until the Commission terminates the license for which the plan was developed and, if any portion of the plan is superseded, retain that superseded

portion for 3 years after the effective date of the change. ~~The training and qualification plan must include a schedule to show how all security personnel will be qualified 2 years after the submitted plan is approved. The training and qualifications plan must be followed by the licensee 60 days after the submitted plan is approved by the NRG.~~

(c) Physical barriers. (1) ~~The licensee shall provide at least two continuous physical barriers one of which is a protected area barrier (e.g., the buildings) and one of which encircles the spent fuel pool of sufficient strength to meet the performance requirements of paragraph (a) of this section. The spent fuel storage building could be considered of sufficient strength to meet this requirement. (1) The licensee shall locate vital equipment only within a vital area, which in turn, shall be located within a protected area such that access to vital equipment requires passage through at least two physical barriers of sufficient strength to meet the performance requirements of paragraph (a) of this section. More than one vital area may be located within a single protected area.~~

~~(2) The spent fuel pool will be considered a vital area and it will have a physical barrier around the top of the pool.~~

~~(2) The physical barriers at the perimeter of the protected area shall be separated from any other barrier designated as a physical barrier for a vital area within the protected area.~~

~~(3) Isolation zones shall be maintained in outdoor areas adjacent to the physical barrier at the perimeter of the vital protected area and interior of protected area and shall be of sufficient size to permit observation of the activities of people on either side of that adjacent to the barrier in the event of its penetration. If parking facilities are provided for employees or visitors, they shall be located outside the isolation zone and exterior to the protected area barrier. No employee or visitor parking of personal vehicles will be permitted inside the vehicle barrier system.~~

~~(4) Detection of penetration or attempted penetration of the protected area or the isolation zone adjacent to the protected area barrier shall assure that adequate response can be requested (e.g. of local law enforcement agency) by the security organization. can be initiated. All exterior areas within adjacent to the protected area shall be periodically checked to detect the presence of unauthorized persons, vehicles, or materials. Periodic patrols of the exterior PA barrier shall be preformed at least once every 8 hours.~~

~~(5) Isolation zones and the interior all exterior areas within the protected area shall be provided with illumination sufficient for the monitoring and observation requirements of paragraphs (c)(3), (c)(4), and (h)(4) of this section. but not less than 0.2 footcandle measured horizontally at ground level.~~

~~(6) The walls, doors, ceiling, floor, and any windows in the walls and in the doors of the reactor control room shall be bullet-resisting. All equipment necessary to support safe operations of the fuel pool will be located in the protected area or secured in manner specified in the plan. A periodic patrol of the interior or the spent fuel pool building shall be preformed least once every 8 hours.~~

~~(7) Vehicle control measures, including vehicle barrier systems, must be established to protect against use of a land vehicle, as specified by the Commission, as a means of transportation to gain unauthorized proximity to protected area and vital areas.~~

~~(8) Each licensee shall compare the vehicle control measures established in accordance with 10 CFR 73.20(c)(7) to the Commission's design goals (i.e., to protect equipment, systems, devices, or material, the failure of which could directly or indirectly endanger public health and safety by exposure to radiation) and criteria for protection against a land vehicle bomb. Each licensee shall either:~~

(i) Confirm to the Commission that the vehicle control measures meet the design goals and criteria specified; or

(ii) Propose alternative measures, in addition to the measures established in accordance with 10 CFR 73.xx (c)(7), describe the level of protection that these alternative measures would provide against a land vehicle bomb. Each site that intends to move or remove the existing vehicle barrier system must make available the technical documentation for that determination. Any event, while fuel is being stored in the spent fuel pool, that would drain down the spent fuel pool, would be considered an unacceptable consequence regarding barrier movement. and compare the costs of the alternative measures with the costs of measures necessary to fully meet the design goals and criteria. The Commission will approve the proposed alternative measures if they provide substantial protection against a land vehicle bomb, and it is determined by an analysis, using the essential elements of 10 CFR 50.109, that the costs of fully meeting the design goals and criteria are not justified by the added protection that would be provided.

(9) Each licensee authorized to operate power reactor site certified under 10 CFR 50.82 shall: nuclear power reactor shall:

(i) Comply with the same vehicle control measures to protect against the design basis vehicle threat previously defined by the Commission. By February 28, 1995 submit to the Commission a summary description of the proposed vehicle control measures as required by 10 CFR 73.55 (e)(7) and the results of the vehicle bomb comparison as required by 10 CFR 73.55 (e)(8). For licensees who choose to propose alternative measures as provided for in 10 CFR 73.55 (e)(8), the proposal must be submitted in accordance with 10 CFR 50.90 and include the analysis and justification for the proposed alternatives.

—(ii) By February 29, 1996 fully implement the required vehicle control measures, including site specific alternative measures as approved by the Commission.

(ii)(iii) Protect as Safeguards Information, information required by the Commission pursuant to 10 CFR 73.xx (c) (8) and (9).

(iii)(iv) Retain, in accordance with 10 CFR 73.70, all comparisons and analyses prepared pursuant to 10 CFR 73.xx (c) (7) and (8).

(10) Each applicant for a license to operate a nuclear power reactor pursuant to 10 CFR 50.21(b) or 10 CFR 50.22, whose application was submitted prior to August 31, 1994, shall incorporate the required vehicle control program into the site Physical Security Plan and implement it by the date of receipt of the operating license.

(d) Access Requirements. (1) The licensee shall control all points of personnel and vehicle access into a protected area by a guard. Identification and search of all individuals unless otherwise provided in this section must be made and authorization must be checked at these points. The search function for detection of firearms, explosives, and incendiary devices must be accomplished through the use of both firearms and explosive detection equipment capable of detecting those devices. The licensee shall subject all persons except bona fide Federal, State, and local law enforcement personnel on official duty to these equipment searches upon entry to a protected area. Armed security Guards who are on duty and have exited the protected area may reenter the protected area without being searched for firearms. When the licensee has cause to suspect that an individual is attempting to introduce firearms, explosives, or incendiary devices into protected areas, the licensee shall conduct a physical pat-down search of that individual. Whenever firearms or explosives detection equipment at a portal is out of service or not operating satisfactorily, the licensee shall conduct a physical pat-down search of all persons who would otherwise have been subject to equipment searches. The individual responsible for the last access control function (controlling admission to the protected area) must be isolated



~~within a bullet-resisting structure as described in paragraph (c)(6) of this section to assure his or her ability to respond or to summon assistance.~~

(2) At the point of personnel and vehicle access into a protected area, all hand-carried packages shall be searched for devices such as firearms, explosives, and incendiary devices, or other items which could be used for radiological sabotage.

(3) All packages and material for delivery into the protected area shall be checked for proper identification and authorization and searched for devices such as firearms, explosives and incendiary devices or other items which could be used for radiological sabotage, prior to admittance into the protected area, except those Commission approved delivery and inspection activities specifically designated by the licensee to be carried out within vital or protected areas for reasons of safety, security or operational necessity.

(4) All vehicles, except under emergency conditions, must be searched for items which could be used for sabotage purposes prior to ~~entry through the VBS into the protected area~~. Vehicle areas to be searched must include the cab, engine compartment, undercarriage, and cargo area. All vehicles, ~~except as indicated in this paragraph, requiring entry into the protected area must be escorted by a guard an armed member of the security organization while within the [VSB] protected area, and, to the extent practicable, must be off loaded in the protected area at a specific designated material receiving area that is not adjacent to a vital area. Escort is not required for designated licensee vehicles or licensee-owned or leased vehicles entering the protected area and driven by personnel having unescorted access. Designated licensee vehicles shall be limited in their use to onsite plant functions and shall remain in the protected area except for operational, maintenance, repair, security, and emergency purposes. The licensee shall exercise positive control over all such designated vehicles to assure that they are used only by authorized persons and for authorized purposes.~~

(5)(i) a numbered picture badge identification system must be used for all individuals who are authorized access to protected areas without escort. An individual not employed by the licensee but who requires frequent and extended access to protected and vital areas may be authorized access to such areas without escort provided that he or she displays a licensee-issued picture badge upon entrance into the protected area which indicates:

- (A) Non-employee no escort required;
- (B) Areas to which access is authorized; and
- (C) The period for which access has been authorized.

(ii) Badges shall be displayed by all individuals while inside the protected area. Badges may be removed from the protected area when measures are in place to confirm the true identity and authorization for access of the badge holder upon entry to the protected area.

(6) Individuals not authorized by the licensee to enter protected areas without escort shall be escorted by a watchman or other individual designated by the licensee while in a protected area and shall be badged to indicate that an escort is required. In addition, the licensee shall require that each individual register his or her name, date, time, purpose of visit, employment affiliation, citizenship, and name of the individual to be visited. The licensee shall retain the register of information for three years after the last entry in the register.

(7) The licensee shall:

(i) Establish an access authorization system to limit unescorted access to ~~protected and vital~~ areas during non-emergency conditions to individuals who require access in order to perform their duties. To achieve this, the licensee shall:

(A) Establish a current authorization access list for the protected area and vital areas. The access list must be updated by the cognizant licensee manager or supervisor at least once

every 31 days and must be reapproved at least quarterly. The licensee shall include on the access list only individuals whose specific duties require access to protected area and vital areas during non-emergency conditions.

(B) Positively control, in accordance with the access list established pursuant to paragraph (d)(7)(I) of this section, all points of personnel and vehicle access to vital areas.

(C) Revoke, in the case of an individual's involuntary termination for cause, the individual's unescorted facility access and retrieve his or her identification badge and other entry devices, as applicable, prior to or simultaneously with notifying this individual of his or her termination.

(D) Lock and protect by an activated intrusion alarm system all entry and exit points to the protected area and unoccupied vital areas.

(ii) Design the access authorization system to accommodate the potential need for rapid ingress or egress of individuals during emergency conditions or situations that could lead to emergency conditions. To help assure this, the licensee shall

~~(a) Ensure prompt access to vital equipment.~~

~~(B) periodically review physical security plans and contingency plans and procedures to evaluate their potential impact on plant and personnel safety.~~

(8) All keys, locks, combinations, and related access control devices used to control access to protected areas and vital areas must be controlled to reduce the probability of compromise. Whenever there is evidence or suspicion that any key, lock, combination, or related access control devices may have been compromised, it must be changed or rotated. The licensee shall issue keys, locks, combinations and other access control devices to protected areas and vital areas only to persons granted unescorted facility access. Whenever an individual's unescorted access is revoked due to his or her lack of trustworthiness, reliability, or inadequate work performance, key, locks, combinations, and related access control devices to which that person had access, must be changed or rotated.

(e) Detection aids. (1) All alarms required pursuant to this part must annunciate in a continuously manned central alarm station. ~~located within the protected area and in at least one other continuously manned station not necessarily onsite, so that a single act cannot remove the capability of calling for assistance or otherwise responding to an alarm.~~ The onsite central alarm station must be considered a vital area and its walls, doors, ceiling, floor, and any windows in the walls and in the doors must be bullet-resisting. The onsite central alarm station must be located within a building in such a manner that the interior of the central alarm station is not visible from the perimeter of the protected area. This station must not contain any operational activities that would interfere with the execution of the alarm response function. Onsite Secondary power supply systems for alarm annunciator equipment and non-portable communications equipment must be located in the protected area as required in paragraph (f) of this section ~~must be located within vital areas.~~

(2) Provide a intrusion detection system for the perimeter of the protected area barrier.

~~(3)(2)~~ All alarm devices including transmission lines to annunciators shall be tamper indicating and self-checking e.g., an automatic indication is provided when failure of the alarm system or a component occurs, or when the system is on standby power. The annunciation of an alarm at the alarm stations shall indicate the type of alarm (e.g., intrusion alarms, emergency exit alarm, etc.) and location.

~~(3) All emergency exits in each protected area and each vital area shall be alarmed.~~

(f) Communication requirements. (1) Each guard or watchman ~~or armed response individual~~ on duty shall be capable of maintaining continuous communication with an individual in the each

continuously manned alarm station required by paragraph (e)(1) of this section, who shall be capable of calling for assistance from other guards, watchmen, and armed response personnel and from local law enforcement authorities.

(2) The alarm stations required by paragraph (e)(1) of this section shall have conventional telephone service, radio (to include cellular communication), or microwave transmitted two-way voice communication for redundant continuous communication with the law enforcement authorities as described in paragraph (f)(1) of this section.

~~(3) To provide the capability of continuous communication, radio or microwave transmitted two-way voice communication, either directly or through an intermediary, shall be established, in addition to conventional telephone service, between local law enforcement authorities and the facility and shall terminate in each continuously manned alarm station required by paragraph (e)(1) of this section.~~

~~(3)(4)~~ Non-portable communications equipment controlled by the licensee and required by this section shall remain operable from independent power sources in the event of the loss of normal power.

(g) Testing and maintenance. Each licensee shall test and maintain in operable conditions intrusion alarms, emergency alarms, communications equipment, physical barriers, and other security related devices or equipment utilized pursuant to this section as follows:

(1) All alarms, communication equipment, physical barriers, and other security related devices or equipment shall be maintained in operable condition. The licensee shall develop and employ compensatory measures including equipment, additional security personnel and specific procedures to assure that the effectiveness of the security system is not reduced by failures or other contingencies affecting the operation of the security related equipment or structures.

(2) Each intrusion alarm shall be tested for performance at the beginning and end of any period that it is used for security. ~~If the period of continuous use is longer than seven days, the intrusion alarm shall~~ and also be tested at least once every seven (7) days.

(3) Communications equipment required for communications onsite shall be tested for performance not less frequently than once at the beginning of each security personnel work shift. Communications equipment required for communications offsite shall be tested for performance not less than once a day.

(4) The security program must be reviewed at least every ~~24~~ 42 months by individuals independent of both security program management and personnel who have direct responsibility for implementation of the security program. ~~The security program review must include all aspects of the security program, include an audit of security procedures and practices, an evaluation of the effectiveness of the physical protection system, an audit of the physical protection system testing and maintenance program, and an audit of commitments established for response by local law enforcement authorities. The results and recommendations of the security program review management's findings on whether the security program is currently effective, and any actions taken as a result of recommendations from prior program reviews must be documented in a report to the licensee's plant manager and to corporate management at least one level higher than that having responsibility for the day-to-day plant operation. These reports must be maintained in an auditable form, available for inspection, for a period of 3 years.~~

(h) Response requirement. (1) The licensee shall establish, maintain, and follow an NRC-approved safeguards contingency plan in accordance with Appendix C of this Part, for responding to threats, thefts, and radiological sabotage, related to the nuclear facilities subject to

the provisions of this section. Safeguards contingency plans must be in accordance with the criteria in appendix C to this part, "Licensee Safeguards Contingency Plans."

(2) The licensee shall establish and document liaison with local law enforcement authorities. The licensee shall retain documentation of the current liaison as a record until the Commission terminates each license for which the liaison was developed and, if any portion of the liaison documentation is superseded, retain the superseded material for three years after each change.

(3) The total number of guards and ~~watchman~~ armed, trained personnel immediately available ~~must include sufficient personnel per shift at the shift to implement security program commitments; at the facility to fulfill these response requirements shall nominally be ten (10), unless specifically required otherwise on a case by case basis by the Commission; however, this number may not be reduced to less than two (2) - five (5) guards.~~

(4) Upon detection of abnormal presence or activity of persons or vehicles within an isolation zone, a protected area, ~~material access area~~, or a vital area or upon evidence or indication of intrusion into a protected area, ~~a material access area~~, or a vital area, the licensee security organization shall:

- (i) Determine whether or not a threat exists,
- (ii) Assess the extent of the threat, if any,
- ~~— (iii) Take immediate concurrent measures to neutralize the threat by:~~
  - ~~— (a) Requiring responding guards or other armed response personnel to interpose themselves between vital areas and material access areas and any adversary attempting entry for the purpose of radiological sabotage or theft of special nuclear material and to intercept any person exiting with special nuclear material, and;~~

~~(iii)(B)~~ Informing local law enforcement agencies (LLEA) of the threat and requesting assistance.

~~(iv) Guards and watchmen will~~ Monitor the threat situation and inform the LLEA of the status upon arrival

~~(5) The licensee shall instruct every guard and all armed response personnel to prevent or impede attempted acts of theft or radiological sabotage by using force sufficient to counter the force directed at him including the use of deadly force when the guard or other armed response person has a reasonable belief it is necessary in self-defense or in the defense of others.~~

~~(5)(6)~~ To facilitate initial response to detection of penetration of the protected area and assessment of the existence of a threat, a capability of observing the isolation zones and the physical barrier at the perimeter of the protected area shall be provided, preferably by means of closed circuit television or by other suitable means which limit exposure of ~~guards or watchmen~~ responding personnel to possible attack.

**D. Example Regulatory Language for Operator Staffing and Training at Decommissioning Plants**

(Changes from existing language is indicated by redlines and strikeouts)

50.54 Conditions of licenses.

(m)(1) A senior operator licensed pursuant to part 55 of this chapter shall be present at the facility or readily available on call at all times during its operation, and shall be present at the facility during initial start-up and approach to power, recovery from an unplanned or unscheduled shut-down or significant reduction in power, and refueling, or as otherwise prescribed in the facility license ~~except for nuclear reactors that have docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel as specified in §50.82(a)(1) or §50.82(b)(1)~~

(m)(2) Notwithstanding any other provisions of this section, by January 1, 1984, licensees of nuclear power units shall meet the following requirements ~~except for nuclear power units that have docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel as specified in §50.82(a)(1) and implemented the operator staffing requirements of §50.54(m)(4)~~ :

(i) Each licensee shall meet the minimum licensed operator staffing requirements in the following table :

Minimum Requirements(1) Per Shift for On-Site Staffing of Nuclear Power Units by Operators and Senior Operators Licensed Under 10 CFR Part 55

Number of nuclear power units operating(2)	Position	One Unit	Two units		Three units	
		One control room	One control room	Two control rooms	Two control rooms	Three control rooms
None.....	Senior Operator.....	1	1	1	1	1
	Operator.....	1	2	2	3	3
One.....	Senior Operator.....	2	2	2	2	2
	Operator.....	2	3	3	4	4
Two.....	Senior Operator.....	.....	2	3	<sup>(3)</sup> 3	3
	Operator.....	.....	3	4	<sup>(3)</sup> 5	5
Three.....	Senior Operator.....	.....	.....	.....	3	4
	Operator.....	.....	.....	.....	5	6

(1) Temporary deviations from the numbers required by this table shall be in accordance with criteria established in the unit's technical specifications.

(2) For the purpose of this table, a nuclear power unit is considered to be operating when it is in a mode other than cold shutdown or refueling as defined by the unit's technical specifications.

(3) The number of required licensed personnel when the operating nuclear power units are controlled from a common control room are two senior operators and four operators.

- (ii) Each licensee shall have at its site a person holding a senior operator license for all fueled units at the site who is assigned responsibility for overall plant operation at all times there is fuel in any unit. If a single senior operator does not hold a senior operator license on all fueled units at the site, then the licensee must have at the site two or more senior operators, who in combination are licensed as senior operators on all fueled units.
- (iii) When a nuclear power unit is in an operational mode other than cold shutdown or refueling, as defined by the unit's technical specifications, each licensee shall have a person holding a senior operator license for the nuclear power unit in the control room at all times. In addition to this senior operator, for each fueled nuclear power unit, a licensed operator or senior operator shall be present at the controls at all times.
- (iv) Each licensee shall have present, during alteration of the core of a nuclear power unit (including fuel loading or transfer), a person holding a senior operator license or a senior operator license limited to fuel handling to directly supervise the activity and, during this time, the licensee shall not assign other duties to this person.

(m)(3) Licensees who cannot meet the January 1, 1984 deadline must submit by October 1, 1983 a request for an extension to the Director of the Office of Nuclear Regulation and demonstrate good cause for the request.

(m)(4) A licensee that has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1), shall maintain staff with the qualifications and capabilities to safely conduct decommissioning activities along with safe handling and storage of spent fuel and respond to plant emergencies. In lieu of meeting the requirements of paragraphs (m)(2) (i)-(iv) above, a permanently shutdown and defueled nuclear power unit shall meet the following minimum operator staffing requirements until all nuclear fuel is removed from the spent fuel pool.

(i) Each licensee shall meet the minimum operator staffing requirements in the following table.

**Minimum Requirements(1) Per Shift for On-Site Operator Staffing of Permanently Shutdown and Defueled Nuclear Power Units**

Number of Physically Separated Spent Fuel Pools Associated with Permanently Shutdown and Defueled Nuclear Power Units Onsite	One Decommissioning Control Station	Two Decommissioning Control Stations	Three Decommissioning Control Stations
One .....	1 Certified Decommissioning Operator 1 Non-Licensed Operator	X	X
Two .....	1 Certified Decommissioning Operator 2 Non-Licensed Operators	2 Certified Decommissioning Operators 2 Non-Licensed Operators	X
Three .....	1 Certified Decommissioning Operator 3 Non-Licensed Operators	2 Certified Decommissioning Operators 3 Non-Licensed Operators	3 Certified Decommissioning Operators 3 Non-Licensed Operators

(1) Temporary deviations from the numbers required by this table shall be in accordance with criteria established in the unit's technical specifications.

(ii) A certified decommissioning operator or non-licensed operator shall be present at all times within the decommissioning control station.

(iii) A certified decommissioning operator shall directly supervise all fuel handling operations and, during this time, the licensee shall not assign other duties to this person.

(iv) For sites that have both operating and permanently shutdown units, the on-shift certified decommissioning operator shall have no assigned responsibility or duties associated with the operating unit.

(m)(5) When all nuclear fuel is removed from the spent fuel pool of a permanently shutdown and defueled nuclear power unit, the operator staffing requirements of paragraph (m)(4) of this section are no longer applicable. However, procedural administrative controls shall be maintained by the licensee to ensure that sufficient qualified operator staff are assigned to operate and maintain the facility in a safe manner while conducting any remaining decommissioning-related activities or respond to plant emergencies.

(m)(6) A licensee that has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1) issued before [the effective date of this rule] is not required to propose to modify its operator staffing to satisfy the requirements of paragraph (m)(4) of this section.

To be consistent with the changes above, §50.54(i),(i-1), (k), and (l) also should be modified to note that these sections do not apply to permanently shutdown and defueled reactors.

- (i) Except as provided in §55.13 of this chapter, the licensee may not permit the manipulation of the controls of any facility by anyone who is not a licensed operator or senior operator as provided in part 55 of this chapter. This requirement is not applicable for a nuclear unit for which the licensee has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1) or §50.82(b)(1).
- (i - 1) Within three months after issuance of an operating license, the licensee shall have in effect an operator requalification program which must as a minimum, meet the requirements of §55.59(c) of this chapter. Notwithstanding the provisions of §50.59, the licensee may not, except as specifically authorized by the Commission decrease the scope of an approved operator requalification program. This requirement is not applicable for a nuclear unit for which the licensee has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1) or §50.82(b)(1).
- (k) An operator or senior operator licensed pursuant to part 55 of this chapter shall be present at the controls at all times during the operation of the facility. This requirement is not applicable for a nuclear unit for which the licensee has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1) or §50.82(b)(1).
- (l) The licensee shall designate individuals to be responsible for directing the licensed activities of licensed operators. These individuals shall be licensed as senior operators pursuant to part 55 of this chapter. This requirement is not applicable for a nuclear unit for which the licensee has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1) or §50.82(b)(1).

#### 50.120 Training and qualification of nuclear power plant personnel.

- (a) Applicability. The requirements of this section apply to each applicant for (applicant) and each holder of an operating license (licensee) for a nuclear power plant of the type specified in §50.21(b) or §50.22.
- (b) Requirements. (1) Each nuclear power plant applicant, by November 22, 1993 or 18 months prior to fuel load, whichever is later, and each nuclear power plant licensee, by November 22, 1993 shall establish, implement, and maintain a training program derived from a systems approach to training as defined in §55.4. The training program must provide for the training and qualification of the following categories of nuclear power plant personnel:
  - (i) Non-licensed operator.
  - (ii) Shift supervisor.
  - (iii) Shift technical advisor.



- (iv) Instrument and control technician.
  - (v) Electrical maintenance personnel.
  - (vi) Mechanical maintenance personnel.
  - (vii) Radiological protection technician.
  - (viii) Chemistry technician.
  - (ix) Engineering support personnel.
- (2) The training program must incorporate the instructional requirements necessary to provide qualified personnel to operate and maintain the facility in a safe manner in all modes of operation. The training program must be developed so as to be in compliance with the facility license, including all technical specifications and applicable regulations. The training program must be periodically evaluated and revised as appropriate to reflect industry experience as well as changes to the facility, procedures, regulations, and quality assurance requirements. The training program must be periodically reviewed by licensee management for effectiveness. Sufficient records must be maintained by the licensee to maintain program integrity and kept available for NRC inspection to verify the adequacy of the program. A nuclear power unit that has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1), shall implement and maintain a training program that incorporates the instructional requirements necessary to provide qualified personnel to operate and maintain the facility in a safe manner associated with long-term spent fuel storage and decommissioning-related activities.
- (3) The requirement to establish a training program for the shift technical advisor per item §50.120(b)(1)(iii) does not apply to a nuclear power unit for which the licensee has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1).
- (4) A training and qualification program for a certified decommissioning operator shall be established and approved by the Commission prior to implementing staffing changes permitted by Section §50.54(m)(4).
- (5) A licensee that has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in §50.82(a)(1) issued before [the effective date of this rule] is not required to propose to modify its training program to satisfy the requirements of paragraphs (b)(2), (b)(3), and (b)(4) of this section.

## 50.2 Definitions

*Certified decommissioning operator* (formerly known as a certified fuel handler) means, for a nuclear power reactor facility which has permanently ceased operation and permanently removed fuel from the reactor, a non-licensed operator who has is qualified to operate, maintain, and conduct activities at the facility in a safe manner in accordance with a fuel handler training program (which includes fuel handling training) approved by the Commission.

*Decommissioning Control Station* means, for a nuclear power reactor which has permanently ceased operation and permanently removed fuel from the reactor, a centralized control location that has monitoring, alarming, communications, command and control capability to provide safety oversight of systems necessary to ensure radiological protection and emergency response during decommissioning activities including spent fuel storage and handling.

**E. Example Regulatory Language for Applying the Backfit Rule to Decommissioning Plants**

(Changes from existing language are indicated by redlines and strikeouts)

**§50.109 Backfitting.**

~~(a) Utilization facilities authorized to operate. (1)(i) (a)(4)~~ Backfitting is defined as...

~~(b) Utilization facilities undergoing decommissioning. (1)(i)~~ Backfitting is defined for utilization facilities undergoing decommissioning as the modification of or addition to systems, structures, components, or design of a facility; ~~or the design approval or manufacturing license for a facility; or the procedures or organization required to decommission, design, construct or operate a facility;~~ any of which may result from a new or amended provision in the Commission rules or the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable staff position after ~~the date of issuance of this rule.~~

~~(i) The date of issuance of the construction permit for the facility for facilities having construction permits issued after October 21, 1985; or~~

~~(ii) Six months before the date of docketing of the operating license application for the facility for facilities having construction permits issued before October 21, 1985; or~~

~~(iii) The date of issuance of the operating license for the facility for facilities having operating licenses; or~~

~~(iv) The date of issuance of the design approval under appendix M, N, or O of part 52.~~

~~(ii) (2)~~ Except as provided in paragraph ~~(b)(1)(iv) (a)(4)~~ of this section, the Commission shall require a systematic and documented analysis pursuant to paragraph ~~(b)(3) (G)~~ of this section for backfits which it seeks to impose.

~~(iii) (3)~~ Except as provided in paragraph ~~(b)(1)(iv) (a)(4)~~ of this section, the Commission shall require the backfitting of a facility only when it determines, based on the analysis described in paragraph ~~(b)(3) (G)~~ of this section, that there is a substantial increase in the overall protection of the public health and safety or the common defense and security to be derived from the backfit and that the direct and indirect costs of implementation for that facility are justified in view of this increased protection.

~~(iv) (4)~~ The provisions of paragraphs ~~(b)(1)(ii) (a)(2)~~ and ~~(b)(1)(iii) (a)(3)~~ of this section are inapplicable and, therefore, backfit analysis is not required and the standards in paragraph ~~(b)(1)(iii) (a)(3)~~ of this section do not apply where the Commission or staff, as appropriate, finds and declares, with appropriated documented evaluation for its finding, either:

~~(A) (i)~~ That a modification is necessary to bring a facility into compliance with a license or the rules or orders of the Commission, or into conformance with written commitments by the licensee; or

~~(B) (ii)~~ That regulatory action is necessary to ensure that the facility provides adequate protection to the health and safety of the public and is in accord with the common defense and security; or

~~(C) (iii)~~ That the regulatory action involves defining or redefining what level of protection to the public health and safety or common defense and security should be regarded as adequate.

- (v) ~~(5)~~ The Commission shall always require the backfitting of a facility if it determines that such regulatory action is necessary to ensure that the facility provides adequate protection to the health and safety of the public and is in accord with the common defense and security.
- (vi) ~~(6)~~ The documented evaluation required by paragraph ~~(b)(1)(iv)~~ ~~(a)(4)~~ of this section shall include a statement of the objectives of and reasons for the modification and the basis for invoking the exception. If immediately effective regulatory action is required, then the documented evaluation may follow rather than precede the regulatory action.
- (vii) ~~(7)~~ If there are two or more ways to achieve compliance with a license or the rules or orders of the Commission, or with written licensee commitments, or there are two or more ways to reach a level of protection which is adequate, then ordinarily the applicant or licensee is free to choose the way which best suits its purposes. However, should it be necessary or appropriate for the Commission to prescribe a specific way to comply with its requirements or to achieve adequate protection, then cost may be a factor in selecting the way, provided that the objective of compliance or adequate protection is met.
- (2) ~~(b)~~ Paragraph ~~(b)(1)(iii)~~ ~~(a)(3)~~ of this section shall not apply to backfits imposed prior to October 21, 1985.
- (3) ~~(e)~~ In reaching the determination required by paragraph ~~(b)(1)(iii)~~ ~~(a)(3)~~ of this section, the Commission will consider how the backfit should be scheduled in light of other ongoing regulatory activities at the facility and, in addition, will consider information available concerning any of the following factors as may be appropriate and any other information relevant and material to the proposed backfit:
- (i) ~~(1)~~ Statement of the specific objectives that the proposed backfit is designed to achieve;
  - (ii) ~~(2)~~ General description of the activity that would be required by the licensee ~~or applicant~~ in order to complete the backfit;
  - (iii) ~~(3)~~ Potential change in the risk to the public from the accidental off-site release of radioactive material;
  - (iv) ~~(4)~~ Potential impact on radiological exposure of facility employees;
  - (v) ~~(5)~~ Installation and continuing costs associated with the backfit, including the cost of facility downtime ~~or the cost of construction decommissioning delay~~;
  - (vi) ~~(6)~~ The potential safety impact of changes in plant ~~major decommissioning activities or operational complexity~~, including the relationship to proposed and existing regulatory requirements;
  - (vii) ~~(7)~~ The estimated resource burden on the NRC associated with the proposed backfit and the availability of such resources;
  - (viii) ~~(8)~~ The potential impact of differences in facility type, ~~and the percentage of decommissioning completed design or age~~ on the relevancy and practicality of the proposed backfit;
  - (ix) ~~(9)~~ Whether the proposed backfit is interim or final and, if interim, the justification for imposing the proposed backfit on an interim basis.
- (4) ~~(d)~~ No licensing action will be withheld during the pendency of backfit analyses required by the Commission's rules.
- (5) ~~(e)~~ The Executive Director for Operations shall be responsible for implementation of this section, and all analyses required by this section shall be approved by the Executive Director for Operations or his designee.