Pt. 50

POLICY ISSUE
(Notation Vote)

June 30, 1999 SECY-99-168

FOR: The Commissioners

FROM: William D. Travers
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SUBJECT: IMPROVING DECOMMISSIONING REGULATIONS FOR NUCLEAR POWER PLANTS

PURPOSE:

To provide the Commission with the status of the staff's recent efforts to assess decommissioning nuclear power plant spent fuel pool risks; to address the consolidation of a number of ongoing rulemakings related to decommissioning into one integrated, risk-informed rule; and to recommend an initiative for achieving overall improvements in decommissioning regulations.

BACKGROUND:

Decommissioning nuclear power plants pose a different risk to public health and safety when compared to operating nuclear plants, but under current regulations they are subject to many of the same requirements. Because the development of regulations for operating nuclear power plants often did not consider decommissioning, requirements imposed on decommissioning nuclear plants may be inappropriate, may not be applicable, or may lack commensurate safety importance. Accordingly, exemptions from inapplicable or unnecessary regulations are frequently requested by licensees after a nuclear power plant is permanently shut down.

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To increase the efficiency and effectiveness of decommissioning regulations, the staff has engaged in rulemaking activities that would reduce the need to routinely process exemptions once a plant has permanently shut down. On the basis of previously established priorities for decommissioning, the staff has concentrated its rulemaking efforts in the areas of emergency planning (EP) and financial protection (insurance). Recent issues regarding decommissioning safeguards requirements have resulted in a rulemaking plan in this area as well. A common concern in each of these rulemakings is the risk associated with storing spent fuel in a spent fuel pool. Staff evaluations of previous exemption requests for decommissioning plant EP programs have been varied and have lacked a consistent technical basis. Development of rulemakings in the areas of EP and insurance has centered on severe spent fuel pool accidents that result from pool drainage or loss of water that uncovers the fuel. Recent analysis of air cooling of the fuel assemblies has revealed an incomplete understanding of a drained spent fuel pool's heatup phenomena and the associated risks. During a Commission meeting on March 17, 1999, the staff proposed to reexamine the risk associated with storage of spent fuel in a spent fuel pool at permanently shutdown nuclear power plants and to develop a risk-informed technical basis for regulatory decision making. In addition, the staff proposed to determine whether decommissioning rulemaking activities in the areas of EP, insurance, safeguards, and possibly other areas could be consolidated into a single, risk-informed rule that, to the extent practical, incorporates the staff's findings from its spent fuel pool risk assessment. As a consequence, the staff reexamined its plan for future decommissioning rulemaking and considered other ways to achieve overall improvement of decommissioning regulations.

DISCUSSION:

Spent Fuel Pool Risks

After a nuclear power plant is permanently shut down and defueled, the traditional accident sequences that dominate operating reactor risk are no longer applicable. The predominant source of risk remaining at permanently shutdown plants involves accidents associated with spent fuel stored in the spent fuel pool. Previous NRC-sponsored studies have evaluated unlikely severe accident scenarios that involve draining of the spent fuel pool cooling and shielding water and uncovering the spent fuel. Although very unlikely, given certain combinations of event scenarios, spent fuel storage configurations, and decay times, the spent fuel assemblies could heat up to a temperature at which a rapid runaway oxidation of the zirconium fuel cladding (zirconium fire) might occur and result in cladding failure and a large offsite release of radioactive materials from the spent fuel. For operating reactors, this issue was addressed by Generic Safety Issue (GSI) 82, "Beyond Design Basis Accidents in Spent Fuel Pools." Cost-benefit evaluations did not indicate that cost effective options were available to mitigate the risks of beyond design-basis accidents in the spent fuel pools; hence no further action was taken related to GSI 82. However, plants undergoing decommissioning typically seek exemptions from Part 50 requirements, such as offsite emergency planning that can factor into the determination of risks from a zirconium fire. When evaluating the acceptability of decommissioning licensee exemption requests from offsite emergency planning, the staff assesses the susceptibility of the spent fuel to a zirconium fire accident. There have been some differences in analyses and criteria used to evaluate previous exemption requests since the exemptions were granted on plant-specific bases. In some cases, the staff has requested heatup evaluations of the spent fuel cooled only by air. A cladding temperature of 565 °C based on the onset of clad swelling has been used as a conservative limit to ensure no radiological release. However, differences in licensee and NRC evaluations of spent fuel

heatup phenomena have resulted in questions from industry stakeholders regarding the NRC's technical and regulatory bases for evaluating specific spent fuel pool severe accident scenarios at decommissioning plants.

To increase the efficiency and effectiveness of decommissioning requirements, the staff acknowledges that a predictable, risk-informed approach needs to be established in the regulations. This need was discussed with the Commission during a meeting on March 17, 1999. The staff formed a technical working group to assess the existing technical and risk information on spent fuel pool accidents at decommissioning plants. The working group plans to develop a risk-informed technical basis for rulemaking activities in the decommissioning area and for the review of exemptions during the interim period prior to completion of rulemaking. The working group was also tasked to identify the need for any research in areas of large uncertainty. The staff considers that such an approach will contribute to safety and reduce unnecessary regulatory burden, as well as increase public confidence in the NRC's decommissioning regulatory oversight process.

Presently, the working group is in the process of performing more generic deterministic analyses than have previously been performed for spent fuel pool studies. The working group also is performing probabilistic analyses for spent fuel pool accidents at decommissioning plants. For deterministic analyses, the working group is performing calculations of the heatup of representative spent fuel configurations to determine the potential for zirconium oxidation and ignition. The most extensive prior work completed in this area was in support of GSI 82. The working group is using these studies as the starting point for its assessment. The working group has found that these studies provide good insights into the phenomena of zirconium oxidation. These previous studies identified that the initiation of a zirconium fire was highly dependent on decay power and fuel storage configuration. The working group has also recognized that current operating reactor spent fuel management practices affect the bounding decay times calculated for the spent fuel heatup analyses in previous studies. Some of these practices include the increase in fuel burnup, which leads to higher decay power, and denser fuel storage racking, which would reduce heat removal.

The working group's preliminary results indicate that on a generic basis, the decay time required to maintain cladding temperature below the self-sustaining zirconium oxidation temperature using air cooling only may be longer than indicated by the generic studies previously performed for operating reactors. Decay time is generally defined as the length of time elapsed since reactor shutdown for the most recently discharged fuel. However, previous plant-specific EP exemptions are unaffected because they were approved using analyses that reflected the actual conditions at the particular plant. The working group has identified two potential deterministic criteria for assessing the potential for a zirconium fire, which are described below.

One potential criterion for allowing the reduction of existing requirements with respect to EP (and possibly other regulatory areas) is the determination that the spent fuel decay heat is sufficiently low that air cooling is adequate to maintain the clad temperature below the point of self-sustained zirconium oxidation. The working group's preliminary estimates using generic, near-bounding thermal-hydraulic spent fuel heatup assumptions indicate that 3 to 5 years of decay time may be needed to reach a point at which air cooling of the fuel is adequate. The working group notes that a plant-specific analysis, using actual parameters such as decay heat and spent fuel pool configuration, should yield shorter time estimates. This type of analysis has

been relied upon for several previous exemption requests. However, the working group recognized that its preliminary results are conservative and could result in significant costs incurred by licensees required to wait several years before requirements were reduced in areas such as EP. The working group is reviewing the temperature criteria used in the spent fuel analysis and the preliminary results indicate that a maximum allowable temperature of 800 °C may be acceptable if certain analysis conditions are met. The conditions for applying this criteria would include demonstrating that the maximum calculated temperature, including uncertainties, remained below the temperature limit, that higher temperature effects are accounted for, and that a release of the radionuclides in the gap between the clad and the fuel is not a concern. The 800 °C temperature limit is based on the lowest temperature for the onset of self-sustaining zirconium oxidation identified by the GSI 82 studies. This is a potential change from the 565 °C temperature criterion for previous exemptions using a spent fuel heatup analysis, which used a temperature limit based on the onset of clad swelling.

The second potential criterion for allowing reduction of existing EP requirements is the determination that sufficient time is available after the fuel is uncovered that offsite protective measures could be taken for the public without preplanning. The working group performed generic, bounding calculations to correlate the decay time of the fuel since final shutdown to the heatup time of the fuel from uncovery to zirconium ignition. The calculations were conservatively based on the heatup time for the hottest rod to heat up from 30 to 900 °C assuming adiabatic conditions (no heat is lost). The staff recognizes that the conditions are nonrealistic because some heat removal would occur. However, it is a bounding calculation that would encompass additional events such as a piece of flat material falling from a building wall or roof on top of fuel assemblies. This type of calculation was used to support two previous site-specific EP exemptions. The working group's preliminary generic results indicate that, at 2 years of decay time for a boiling-water reactor and 2.5 years for a pressurized-water reactor, about 10 hours will be available from fuel uncovery before onset of zirconium ignition. In a recent plant-specific EP exemption, the staff determined that 10 hours was sufficient time to take mitigative actions and, if necessary, offsite protective measures without preplanning. However, further evaluation is needed to determine whether a generic time to take protective actions without preplanning is appropriate for all plants (or a group of plants) or whether a site-specific time should be determined for each plant. In addition, a more realistic calculation using plant-specific parameters or not using adiabatic conditions could yield shorter estimates of the decay time needed to achieve a given heat up time.

The working group is also performing a probabilistic analysis of the initiating events that could lead to fuel uncovery and the consequences of a zirconium fire at decommissioning plants. The analysis considers a wide range of initiating events. An important factor in this type of analysis is the amount of redundancy and diversity of spent fuel pool heat removal systems, spent fuel pool makeup systems, and their support systems. On the basis of information gathered by the working group in site visits to four decommissioning plants, the system configurations being analyzed as part of the group's probabilistic analysis have significantly reduced levels of redundancy and diversity relative to operating plants. No decommissioning plant today matches the conditions assumed in the working group's risk assessment. In the analysis, it is assumed the spent fuel has 1 year of decay time and the spent fuel pool support systems are as found at plants that have been shut down for 2 or more years. The conditions being assumed in the working group's analysis do not apply to operating plants because of differences in areas such as support systems and personnel availability. The working group's preliminary results indicate that there are several credible initiators for decommissioning plants including: internal fires, loss of coolant inventory, cask drop, seismic events, loss of offsite power, tornado missiles, loss of pool cooling, and aircraft impact. The risks from some of these initiators cannot be dismissed based on observation.

Since the Commission meeting on March 17, 1999, the staff has held three public meetings with stakeholders to discuss the mission of the working group, the outline of the team's effort, the preliminary results as described herein, and plans for further involvement by the stakeholders. On June 7, 1999, the working group presented the preliminary results to the Nuclear Energy Institute and the other stakeholders for discussion purposes only and stated it would be premature to apply any findings to the regulatory process at this time. The working group plans to release a preliminary draft of portions of its study, which includes the scope of the study, the assumptions used in the deterministic and probabilistic analyses, and basic insights prior to a public workshop on this study to be conducted in July of 1999. The workshop will focus on operational and design characteristics that could limit the frequency of fuel uncovery at decommissioning plants. After the workshop, the working group plans to involve outside technical organizations with the report for an independent, technical, quality review to refine the working group's methods and results, and to provide the stakeholders an opportunity to be further involved in the process. This review process is expected to be complete by December 1999. The working group will consider the information shared in the workshop and the results from the independent, technical, quality review process before completing the final report. The final report will be completed in March 2000 and should provide a risk-informed technical basis for reducing existing regulatory requirements with respect to EP, insurance, and possibly other requirements at decommissioning plants. Depending on the outcome of the workshop in July of 1999, the staff may shorten the schedule for completing the final report.

Integration of Decommissioning Rulemaking

On the basis of decommissioning priorities established in SECY-98-258, "Decommissioning Licensing Actions and Priorities and Milestones for Addressing Rulemaking and Guidance Development," the staff has concentrated its rulemaking efforts in the areas of EP, insurance, and safeguards. Each of these rulemaking activities has been managed independently and, until recently, has been at different stages of the rulemaking process. Specifically, the proposed rule for decommissioning EP was being prepared for public comment when it encountered delays associated with resolution of the spent fuel pool risk issue. The proposed rule on insurance requirements at decommissioning nuclear power plants was in the process of being republished for public comment when similar issues associated with spent fuel pool risks halted its progress. In addition, a rulemaking plan to establish safeguards requirements for decommissioning nuclear power plants has been under consideration. Decision-making related to safeguards requirements will need to consider the design and operation of both spent fuel pools and independent spent fuel storage installations and ensure that proposed changes reflect a consistent approach in the physical protection of spent fuel that is based on risk. Because of the technical uncertainties associated with these decommissioning rulemakings, the staff suspended its efforts until spent fuel pool risk-related issues could be satisfactorily resolved. As discussed in the previous section, the spent fuel pool risk assessment is still being developed. Preliminary results indicate that spent fuel pool risk for decommissioning nuclear power plants is likely to affect the current decommissioning rulemakings; therefore, the staff does not plan to recommence rulemaking activities until the risk assessment is complete.

During a meeting on March 17, 1999, with the Commission, the staff was requested to determine whether decommissioning rulemaking activities in the areas of EP, insurance, safeguards, and possibly others could be consolidated into a single, risk-informed rule. Preliminary findings from the spent fuel pool risk study imply that technical revisions to the basis for the current EP and insurance rulemakings are required that will result in substantial changes to these proposed rules. The staff has determined that combining EP and insurance into a single decommissioning rulemaking would be appropriate given the likely need to extensively

rework the current rulemakings to incorporate any recommendations from the spent fuel pool risk assessment. In addition, since the safeguards rulemaking has not yet begun, it could be combined with the EP and insurance rulemakings as part of an integrated, risk-informed, proposed decommissioning rule.

The staff recognizes there is a potential for resource savings and efficiency by processing only one consolidated decommissioning rule versus multiple separate rules. Accordingly, the staff reviewed other decommissioning rulemakings under consideration that can be accomplished within the time frame and with the resources allocated for the EP, insurance, and safeguards rulemakings. One area where the staff identified the need for changes in decommissioning regulations involves operator staffing and training requirements. Development of regulations for operator staffing and training can be based on codifying current practices at decommissioning nuclear power plants and, as such, may not require extensive technical or policy reviews that might affect the schedule of higher priority rulemaking. There is, however, a possibility that conclusions from the spent fuel pool risk assessment will influence decisions on the appropriate operator oversight and training needed to ensure that human performance factor related risks are minimized. Since there is no advantage to processing this rulemaking independently, the staff will address operator staffing and training as part of an integrated rulemaking with EP, insurance, and safeguards. In addition, the Commission directed the staff in a staff requirements memorandum dated February 12, 1999, to propose a rulemaking plan that clarifies the applicability of the backfit rule, Section 50.109 to Title 10 of the Code of Federal Regulations (CFR), to decommissioning nuclear power plants. The Commission stated that backfit rulemaking for decommissioning should not be high priority. Because the staff is already applying backfit considerations to decommissioning requirements, there would be little benefit from moving forward with this rulemaking separately. Therefore, the staff will also address changes to clarify backfit rule applicability as part of an integrated, risk-informed rule for decommissioning nuclear power plants.

The staff notes that evaluation of entombment as a decommissioning option is still under consideration. This effort is being coordinated by the Office of Nuclear Regulatory Research (RES). Since this potential rulemaking will not be affected by the spent fuel pool risk assessment and is not currently identified as a high-priority item to industry stakeholders, the staff will continue to examine the entombment regulatory options independently of other decommissioning rulemaking activities.

In summary, rather than processing rulemakings for the following decommissioning-related regulations separately, the staff recommends addressing these topics within an integrated, risk-informed decommissioning rule.

- Emergency planning
- Onsite and offsite insurance (financial indemnity)
- Safeguards
- Operator staffing and training
- Backfit rule applicability

Since all the above rulemaking efforts, with the exception of the backfit rule applicability, are related to the risk associated with the spent fuel pool, the staff will not pursue rulemaking in these areas, either combined or separately, until the spent fuel pool risk assessment is complete. The staff estimates that the spent fuel pool risk assessment will be completed by March 31, 2000. Therefore, the staff will provide the Commission a new rulemaking plan for the

consolidated decommissioning rule, together with associated schedule and resource details, by May 31, 2000. This is a significant schedule change from prior commitments for rulemakings in the areas of EP and insurance. However, the staff does not believe the rulemaking activities can be accelerated until the spent fuel pool risk is adequately defined. In the interim, the staff will continue to address any exemption requests on a plant-specific basis using information developed from the spent fuel pool risk assessment to ensure a consistent and appropriate level of protection is maintained.

Decommissioning Regulatory Improvement Initiative

In addition to the need to process exemptions for nuclear power plant decommissioning, the staff has had recurring interactions with licensees and industry stakeholders with respect to the applicability of existing regulations to decommissioning plants. The staff has concluded that this is due to the varying language of applicability used in the regulations, together with the fact that a truly comprehensive review of the applicability of Title 10 regulations to decommissioning nuclear power plants has not been performed. Even though a decommissioning nuclear power plant's authority to operate is removed by regulation, it still retains an operating license that subjects it to most of the requirements in 10 CFR Part 50 (unless excluded from a requirement on the basis of conditions specified in the regulation). Regulatory requirements or regulatory exclusions specifically applicable to decommissioning nuclear power plants are scattered throughout Part 50 and, to a lesser extent, other parts of Title 10. To clearly distinguish the regulations applicable to decommissioning from those applicable to operating nuclear power plants, a more coherent regulatory structure is appropriate. Consequently, the staff developed an initiative for improving decommissioning regulations which is described in detail in the attachment to this paper. The premise of this initiative is based on achieving the following two goals:

- identification and clarification of regulations applicable to decommissioning nuclear power plants, and

- restructuring of the current framework for decommissioning regulations to separate decommissioning plant requirements from operating plant requirements

After considering various options and alternatives, the staff determined a course of action that, if implemented, would achieve these goals. First, the staff recommends a detailed regulatory review of the requirements for Part 50 license holders to determine their applicability to decommissioning nuclear power plants. Secondly, the staff recommends efforts be initiated to consolidate regulations for decommissioning nuclear power plants into a separate part under Title 10.

The plan for accomplishing this decommissioning regulatory improvement initiative will be conducted in phases. After receiving the Commission's approval to proceed with the plan, the staff will conduct a decommissioning regulatory review that will identify regulations applicable to decommissioning, as well as those regulations that need to be changed to reflect the differences between operating and decommissioning nuclear power plants. This would be completed in approximately 3 months. The staff will then develop a model of the regulatory framework to be used for consolidating decommissioning requirements into a separate part under Title 10. The model would be completed approximately 8 months after approval of this initiative. The next phase would be to develop a proposed rulemaking package that would detail the consolidation of the decommissioning regulations into a new part and propose any changes to existing regulations. The rulemaking plan will also provide resource and schedule estimates to complete this decommissioning regulatory consolidation and reorganization using

the rulemaking process. Additional issues that come out of the regulatory review, as well as the associated costs and benefits, will also need to be assessed in the rulemaking plan. The staff will provide this information in the process of preparing a rulemaking plan for the Commission. It is the staff's judgment that a rulemaking plan delivering the details for relocating the decommissioning regulations to a new part, together with recommended changes to the regulations, can be submitted to the Commission within 12 months after approval of this initiative.

Because of the scope and magnitude of changes involved in consolidating the decommissioning regulations into a new part within Title 10, combined with likely identification of the need for regulatory changes, the staff will meet with stakeholders several times before completing a rulemaking plan to solicit early comments from the public and industry on the merits of this regulatory approach for decommissioning. Three public meetings have already been conducted with stakeholders during which the staff's initiative for improving decommissioning regulations was discussed. These meetings occurred on April 13, May 5, and June 7, 1999. Further meetings with the public are planned. The staff also anticipates the use of an advanced notice of proposed rulemaking after receiving approval of a rulemaking plan to ensure all stakeholders continue to have an early opportunity to participate in the development of the new decommissioning regulations. Otherwise, processing of this regulatory initiative will proceed as any other rulemaking activity within the NRC. The overall plans and schedule for this initiative are provided in the attachment to this paper.

COORDINATION:

The Office of General Counsel has reviewed this paper and has no legal objections to its contents. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections to its contents. Coordination with Office of Nuclear Material Safety and Safeguards (NMSS), RES, and the regions has been conducted through the Decommissioning Management Board. The Chief Information Officer has reviewed this paper for information technology and information management implications and concurs with it.

RESOURCES:

Resources to allow the staff technical working group to finalize a risk-informed technical basis for decommissioning rulemaking activities are not currently budgeted. The necessary resources (1.4 FTE and $185K in FY-99; 2.6 FTE and $150K in FY-00) will be reprogrammed.

No additional resources should be required to combine the five separate rulemaking activities (involving EP, insurance, safeguards, operator staffing and training, and backfit) into a single rulemaking. Budgeted resources (2.0 FTE in FY-00 and 2.0 FTE in FY-01) are adequate.

It is estimated that the effort to identify regulatory applicability and develop a rulemaking plan for consolidating decommissioning regulations for nuclear plants into a separate part of Title 10 will require the expenditure of approximately 2 FTE (1.0 FTE in FY-99 and 1.0 FTE in FY-00). The resources for this effort are budgeted and available. In addition, $300K ($100K in FY-99 and $200K in FY-00) for contractor technical support is estimated for this effort. The contractor support funding is budgeted and available. Additional resource needs to address any proposed changes to decommissioning regulations are unbudgeted and may vary substantially, depending on the number of requirements changed, the nature of each specific change, and the complexity of the change. The rulemaking plan being provided to the Commission upon completion of the staff's decommissioning regulatory review and relocation model development will identify additional resource costs for completing the rule.

RECOMMENDATIONS:

That the Commission:

1. Approve the plan and schedule for completion of the spent fuel pool risk assessment as discussed in the spent fuel pool risks section of this paper.

2. Approve the development of a single, integrated, risk-informed decommissioning rule for EP, insurance, safeguards, operator training and staffing, and backfit utilizing the criteria developed from the spent fuel pool risk assessment, as appropriate, rather than processing rulemakings in each of these areas separately.

3. Approve the approach recommended by the staff in the attached initiative for improving nuclear power plant decommissioning regulations, including a decommissioning regulatory applicability review and development of a rulemaking plan to consolidate decommissioning regulations for nuclear power plants into a separate part within Title 10.

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Attachment: Initiative for Improving Nuclear Power
Plant Decommissioning Regulations

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INITIATIVE FOR IMPROVING NUCLEAR POWER PLANT
DECOMMISSIONING REGULATIONS

Purpose

Both the Commission and the stakeholders have recently indicated that an overall improvement of nuclear power plant decommissioning regulations may be warranted. The current approach to upgrading decommissioning requirements is to pursue rulemaking for those areas in which changes or reductions to unnecessary regulatory burdens will have the most impact for the licensee or the NRC or both. However, the staff now seeks the Commission's approval of a high-level initiative that sets goals and defines an initiative for improving nuclear power plant regulations.

Discussion

When a nuclear power plant licensee certifies permanent cessation of operation and removal of fuel from the reactor, its authority to operate is withdrawn. Despite withdrawal of authority to operate, a decommissioning nuclear power plant still retains a Part 50 "operating license." As such, the decommissioning plant is subject to many of the requirements that apply to operating plant Part 50 licensees. Only if a requirement specifically excludes decommissioning plants or limits applicability to nuclear power plants authorized to operate is there a legal basis for excluding the requirement from the purview of decommissioning regulations. Consequently, it is difficult to distinguish between those requirements that apply only to operating nuclear power plants and those requirements applicable to decommissioning plants. The staff believes that there is a need to clarify which requirements from Part 50, as well as other parts of Title 10 of the Code of Federal Regulations (CFR), are applicable to nuclear power plants undergoing decommissioning. For example, the applicability of the station blackout rule (10 CFR 50.63) or the fitness-for-duty program (10 CFR Part 26) has not been clearly established for decommissioning regulations. How are general design criteria (GDC) applied to decommissioning plants? Do the control room habitability criteria of GDC 19 remain in effect for a decommissioning plant? Do decommissioning nuclear power plants even have to maintain a control room?

As part of the initiative to improve decommissioning regulations for nuclear power plants, the staff also reviewed the existing regulatory structure and framework. Part 50 primarily regulates the design, construction, licensing, and operation of nuclear power plants. The basic structure of Part 50 has not changed since the 1960s. As regulatory and safety concerns were identified in the ensuing years, new appendices and sections were added. However, consideration was seldom given to decommissioning or to the decommissioning regulatory processes during the maturing of Part 50. Through numerous rulemakings to limit applicability, extend applicability, and otherwise constrain existing regulations, the decommissioning regulatory program has been defined within the existing framework of 10 CFR Part 50. Because nuclear power plant decommissioning requirements are intertwined with operating plant requirements, regulations applicable to decommissioning are scattered throughout Part 50. Until now, it has been assumed that ongoing and future decommissioning rulemaking would continue to support the regulatory framework within 10 CFR Part 50. The staff has examined this convention and believes that an overall improvement of decommissioning regulations can be accomplished by a major restructuring of the existing regulatory framework.

Attachment

In summary, the staff believes that the regulations applicable to decommissioning have not been clearly identified. The staff, therefore, proposes a high-level initiative to improve decommissioning regulations that has two goals:

- identification and clarification of regulations applicable to decommissioning nuclear power plants, and
- restructuring of the current regulatory framework for decommissioning regulations to separate decommissioning plant requirements from operating plant requirements

Regulatory Improvement Initiative

The following is a qualitative assessment of several options and alternatives considered in developing the regulatory improvement initiative.

Options 1 and 2 are the options considered by the staff in achieving the first goal of the proposed decommissioning regulatory improvement initiative: "identification and clarification of regulations applicable to decommissioning nuclear power plants."

OPTION 1: Status quo. Address decommissioning regulation deficiencies on a case-by-case basis.

Advantages

- continue current program of incremental improvements of decommissioning regulations, making appropriate adjustments as more decommissioning experience is acquired
- no significant additional resource implications in continuing the current rulemaking process are required

Disadvantages

- lack of clarity of decommissioning regulations may cause unnecessary industry and NRC resource expenditures in processing exemptions, amendments, and other licensing actions
- regulatory ambiguity of decommissioning requirements can lead to inconsistent or unnecessary compliance by licensees. Staff interpretations of decommissioning regulations may also vary
- does not afford an opportunity for an integrated assessment of the regulatory basis for decommissioning nuclear power plants. Less likely to benefit from risk informing when considering regulations individually

OPTION 2: Perform a comprehensive regulatory review of Title 10 to determine which regulations are applicable to decommissioning nuclear power plants. In addition, identify what regulatory clarifications or modifications may be appropriate based on differences between operating and decommissioning nuclear power plants.

Advantages

- clarifies regulatory applicability of 10 CFR to decommissioning nuclear power plants
- provides a regulatory road map to decommissioning requirements (even if no regulations are changed)
- reveals unnecessary decommissioning regulations
- reveals unnecessarily burdensome decommissioning regulations
- reveals decommissioning regulations that have indeterminate applicability
- identifies future prospects for decommissioning rulemaking

Disadvantages

- Usefulness is primarily contingent on committing resources to extensive decommissioning regulatory changes

If Option 2 is approved, the following are the alternatives considered by the staff for achieving the second goal of the proposed decommissioning regulatory improvement initiative: "restructuring of the current regulatory framework for decommissioning regulations to separate decommissioning plant requirements from operating plant requirements."

Alternative 1: Retain the existing regulatory structure for decommissioning regulations within 10 CFR Part 50 and provide a regulatory guide that identifies and interprets the regulations pertinent to decommissioning nuclear power plants.

Advantages

- licensees are generally familiar with the placement of decommissioning requirements within the structure of Part 50, even without any clear distinction between operating and decommissioning regulations
- fewer staff resources needed to accomplish than Alternatives 2 or 3
- can be accomplished more quickly than rulemaking

Disadvantages

- as significant amendments are made to Part 50 decommissioning regulations, the overall regulatory road map for decommissioning will become more convoluted and difficult to follow
- not consistent with increasing public confidence in the regulatory process
- while operating regulations remain commingled with decommissioning regulations, potential to inadvertently affect decommissioning regulations exists anytime operating regulations are modified

- a regulatory guide for this alternative would be primarily an administrative road map on decommissioning requirement applicability and would not be an appropriate way to risk-inform the regulations

- if scope of an existing regulation cannot be interpreted to exclude decommissioning, even if application of the regulation to decommissioning would not serve the underlying purpose of the rule, then a regulatory guide would be insufficient

- use of a regulatory guide is not legally binding and could result in unnecessary NRC or licensee resource expenditures for reviewing alternatives not addressed in the regulatory guide

Alternative 2: Create a new part within Title 10 that relocates significant regulations and requirements applicable to decommissioning nuclear power plants.

Advantages

- establishes a consolidated location dedicated to nuclear power plant decommissioning regulations

- minimizes impact upon existing construction, design, licensing, and operating regulations

- facilitates further development of risk-informed, performance-oriented regulations for decommissioning

- should ultimately increase efficiency and effectiveness of decommissioning regulations

- should reduce the need for future rulemaking or issuance of exemptions

- similar to precedent established for license renewal regulations

- stakeholders, both industry and members of the public, have indicated support for this approach during meetings

Disadvantages

- may be resource intensive and take a long time to complete

- may result in some increased costs to licensees in revising references to relocated decommissioning regulations

- does not provide any direct regulatory burden reduction

- may need to duplicate some Part 50 administrative/generally applicable requirements in the new part (e.g., OMB clearance, record retention, deliberate misconduct)

- resources for completing this effort (Phases 4 and 5 as detailed in the following section) are not currently identified or programmed

Alternative 3: Relocate all decommissioning requirements of 10 CFR Part 50 under a single subpart within Part 50.

Advantages

- establishes a consolidated location dedicated to nuclear power plant decommissioning regulations
- facilitates further development of risk-informed, performance-oriented regulations for decommissioning
- should ultimately increase efficiency and effectiveness of decommissioning regulations
- may reduce the need for future rulemaking or issuance of exemptions
- may alleviate the need to duplicate administrative and certain generally applicable requirements if the decommissioning regulations are retained within Part 50

Disadvantages

- may be resource intensive and take a long time to complete
- may result in increased costs to licensees in revising references to relocated decommissioning regulations
- does not provide any direct regulatory burden reduction
- resources for completing this effort (Phases 4 and 5 as detailed in the following section) are not currently identified or programmed
- potential uncertainties in regulatory applicability may persist where operating and decommissioning regulations are shared or combined

Recommended Approach

To clarify any ambiguities and uncertainties regarding which regulations do apply or do not apply to decommissioning nuclear power plants, the staff recommends a focused and orderly review of the bases of all regulations and requirements applicable to Part 50 license holders as suggested by Option 2. This review will also assess the complexity of potential decommissioning regulatory changes ranging from minor clarifications of scope to substantive changes involving the underlying purpose of a rule. The results will enhance the efficiency and effectiveness of future decommissioning rulemaking decisions.

After considering the alternatives under Option 2 for improving the decommissioning regulatory structure and framework and based on the potential for creating an efficient, integrated, and consistent regulatory fabric for decommissioning nuclear power plants, the staff recommends that efforts be initiated to consolidate the decommissioning regulations into a new part within Title 10 in accordance with Alternative 2 above. It is the staff's conclusion that establishing a new part for decommissioning will be the most effective approach, in terms of contributing to

the overall clarity of decommissioning requirements. The viability of such an approach has already been established with plant standardization and license renewal regulations in Parts 52 and 54. This effort will be primarily a mechanistic relocation of the decommissioning regulations into a blank structural framework afforded by a new part. Because there are no constraints on the new framework, there will be considerable flexibility in the manner in which this goal is accomplished.

The staff acknowledges that the relocation of decommissioning regulations within a new part of 10 CFR has not had the benefit of a full internal or external stakeholder review. Currently unidentified technical or administrative difficulties in creating a new part may significantly increase the resources needed to complete this project. Additional issues that come out of the regulatory review, as well as the associated cost of resolution, will also need to be assessed. Consequently, a preliminary model of a new 10 CFR part for nuclear power plant decommissioning regulations will be developed. The staff will use the information learned from preparing the model to accurately estimate the staff resources needed to complete the decommissioning regulatory restructuring using the rulemaking process. Prior to expending any substantial resources, the staff will prepare a rulemaking plan for Commission approval. The rulemaking plan will present resource estimates for completing the restructuring and further details on the process of relocating the decommissioning regulations. The rulemaking plan will also include proposals for amending the decommissioning regulations as deemed appropriate by the staff based on analysis of the regulatory review.

The plan for accomplishing this regulatory improvement initiative will be conducted in phases. An outline of these phases and the time estimate for completion is provided below:

REGULATORY IMPROVEMENT INITIATIVE —— RECOMMENDED APPROACH		Estimated Completion Time From Start of Project
Phase 1: (Option 2)	Perform a detailed review of Title 10 to identify regulations applicable to decommissioning. Segregate the regulations into the following four bins: • Bin 1 - Regulations that are fully applicable to decommissioning nuclear power plants without substantive modification • Bin 2 - Regulations that are not applicable to decommissioning nuclear power plants • Bin 3 - Regulations that have indeterminate applicability to decommissioning nuclear power plants • Bin 4 - Regulations that are applicable to decommissioning nuclear power plants to some extent but require substantive modifications. Items in this bin would include: – regulations that are only partially applicable – regulations that may be applicable for only a limited time – regulations that are amenable to risk-informed, performance-based approaches	3 months

Phase 2: Construct a model for relocating decommissioning regulations. 8 months
(Alternative 2 - Funded)

- Develop the structural framework in which the decommissioning regulations will be consolidated and located

Phase 3: Submit rulemaking plan for decommissioning regulatory consolidation
(Alternative 2 - Funded) 12 months

- Identify regulatory problems and policy issues related to those regulations applicable to decommissioning that require substantive changes as categorized in Bins 3 and 4 (Phase 1) above

- Provide detailed resource impact and schedule

Phase 4: Issue an advanced notice of proposed rulemaking (ANPR) 16 months
(Alternative 2 - Not funded)

- Obtain stakeholder input on the content and framework of the improved decommissioning regulatory initiative

Phase 5: Issue a proposed decommissioning regulatory improvement rule 24 months
(Alternative 2 - Not funded)

- Issue a proposed rule that provides overall clarifications to decommissioning regulations and relocates them to a new part within Title 10

The staff believes that early input from stakeholders is essential in achieving a product that is satisfactory for both the public and the Commission. It is the staff's intention to conduct several stakeholder meetings following completion of Phase 1 and before submitting the Phase 3 rulemaking plan to the Commission. In addition, the staff plans to publish an ANPR to solicit public comments and suggestions on the merits of the proposed approach if the Commission approves the Phase 3 rulemaking plan.

Resources

It is estimated that the effort to identify and clarify regulatory applicability (proposed Option 2 as detailed in Phase 1) and develop a rulemaking plan for consolidating decommissioning regulations for nuclear plants into a separate part of Title 10 (proposed Alternative 2 as detailed in Phases 2 and 3) will require the expenditure of approximately two additional FTE (1.0 FTE in FY-99 and 1.0 FTE in FY-00). The resources for this effort are budgeted and available. In addition, $300K ($100K in FY-99 and $200K in FY-00) for contractor technical support is estimated for this effort. The contractor support funding is budgeted and available. The rulemaking plan being provided to the Commission upon completion of Phase 3 will identify any additional resource costs associated with completing the rulemaking, as well as any regulatory changes that the staff chooses to include with the proposed rule. Additional resource needs to address any proposed changes to decommissioning regulations (Phases 4 and 5) may vary substantially, depending on the number of requirements changed, the nature of each specific change, and the complexity of the change made.