POLICY ISSUE
(Notation Vote)

October 7, 2013 SECY-13-0108

FOR: The Commissioners

FROM: Mark A. Satorius
Executive Director for Operations

SUBJECT: STAFF RECOMMENDATIONS FOR ADDRESSING REMEDIATION OF RESIDUAL RADIOACTIVITY DURING OPERATIONS

PURPOSE:

To provide the Commission with an evaluation of options and staff recommendations to address remediation of residual radioactivity at licensed facilities during the operational phase of facility life, known as prompt remediation. This paper also evaluates stakeholder comments received on prompt remediation. This paper does not address any resource implications.

SUMMARY:

In Staff Requirements Memorandum (SRM)-SECY-07-0177 the Commission directed the staff to make further improvements to the decommissioning planning process by addressing remediation of residual radioactivity during the operational phase of plant life with the objective of avoiding complex decommissioning challenges that can lead to legacy sites.

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In SRM-SECY-12-0046, the Commission further directed the staff to continue the current regulatory approach for groundwater protection, including the recently imposed additional requirements contained in the Decommissioning Planning Rule (DPR), and to solicit public comments on the technical basis for a proposed prompt remediation rule, and provide its evaluation of the comments to the Commission in a notation vote paper. The Commission directed the staff to include the pros and cons of moving forward with a proposed prompt remediation rulemaking, including the staff's initial analysis of whether the cost/benefit analysis satisfies the backfit requirements. The staff conducted an additional public meeting and webinar on June 4, 2013, and subsequently evaluated stakeholder comments (see Enclosure 1). From this information, the staff identified the following three options for potential rulemaking on prompt remediation during the operational phase of facility life.

1. Proceed with rulemaking.
2. Do not proceed with rulemaking.
3. Collect 2 years of information (2013-2014) from implementation of the DPR before making a staff recommendation for potential rulemaking.

The U.S. Nuclear Regulatory Commission (NRC) staff recommends option 3.

BACKGROUND:

In 62 FR 39088 (July 21, 1997), the NRC issued Subpart E "Radiological Criteria for License Termination" to Part 20 "Standards For Protection Against Radiation," also known as the license termination rule (LTR). Following the promulgation of the LTR, in SRM SECY-01-0194, the Commission directed the staff to conduct an analysis of LTR issues. The staff presented the results of its analyses and recommendations for action in SECY-03-0069. In SRM-SECY-03-0069, the Commission approved the staff recommendations to proceed with rulemaking for a DPR that would require that costs to remediate residual radioactivity be included in the decommissioning cost estimate and in the appropriate financial assurance instruments for most licensees.

During development of the DPR in 2004-2007, the staff discussed the proposed rule with the Advisory Committee on Nuclear Waste (ACNW) on several occasions. The Committee observed that "premature action in the absence of adequate understanding of the site and system behavior may be inappropriate or even counter-productive to remediation goals" and recommended against incorporating a requirement for remediation during operation.[1] Therefore, staff did not include remediation during operation in the technical basis or in the draft DPR in SECY-07-0177.

[1] Letter from Michael T. Ryan, Chairman, ACNW, to Dale E. Klein, Chairman, NRC, "Prevention of Legacy Sites," October 17, 2006 (ML062960469)

However, in SRM-SECY-07-0177, which approved publication of the draft DPR, the Commission directed the staff to "make further improvements to the decommissioning planning process by addressing remediation of residual radioactivity during the operational phase." The SRM further directed that:

> *"… the staff should engage stakeholders to develop a technical basis, possible dose limits, criteria for applying the dose limits to address this matter, or alternatives to the dose limits to address the intent of this objective."*

To that end, the staff developed a proposed draft technical basis for prompt remediation (ML111580353) and published a *Federal Register* notice (76 FR 42074) announcing the NRC's intent for "Consideration of Rulemaking To Address Prompt Remediation of Residual Radioactivity During Operations." The staff then conducted a public meeting and webinar on July 25, 2011, obtained and evaluated additional stakeholder comments, and revised the draft Regulatory Basis (ML120190685). In the revised draft Regulatory Basis (Enclosure 2), the staff identified the following alternatives for addressing remediation during the operational phase.

1. Conduct rulemaking to require licensee to conduct prompt remediation if contamination exceeds specified levels (e.g., if the calculated dose exceeds 100 mrem/y).
2. Conduct rulemaking to require licensees to perform analyses and develop an action plan consistent with risk and timeliness if contamination concentration exceeds specified levels (e.g., ~50 mrem/y, as estimated by Table 2 to Appendix B of Part 20 for ground water, and twice the screening values in Appendix H to NUREG-1757 Vol. 2, "Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria" for soil and building surfaces).
3. Develop an NRC policy to modify site-specific license conditions to limit contamination.
4. Write NRC guidance supporting the benefits of early remediation.
5. Continue the current policy of case-by-case decision making.

DISCUSSION:

Stakeholder Input:

As directed by the Commission in SRM-SECY-12-0046, the staff solicited public comments on the technical basis for proposed prompt remediation rulemaking and evaluated the stakeholder comments. The staff is now providing the Commission with an evaluation of options to address prompt remediation of radiological contamination at licensed facilities during the operation phase of facility life and recommending a course of action. This notation vote paper also includes the staff's initial analysis of backfit requirements.

On June 4, 2013, the staff conducted a second public meeting and webinar to obtain stakeholder input on potential rulemaking about prompt remediation. Stakeholder comment summaries and staff responses are in Enclosure 1.

There is broad agreement among both industry and non-industry stakeholders that minimizing contamination throughout the life of a facility is a good practice in keeping with the as low as reasonably achievable (ALARA) principle. There is less agreement on how that should be accomplished. In general, industry stakeholders believe that with the combination of existing NRC regulations and industry voluntary initiatives, there are sufficient prerequisites to achieve

the remediation goal and additional regulation is not needed. Many non-industry stakeholders expressed the opinion that additional regulatory requirements for prompt remediation are needed to ensure that facilities are able to meet the criteria for site release for unrestricted use at the time of decommissioning.

One significant comment from industry stakeholders was that there are already sufficient NRC requirements to report contamination events that lead to the use of additional radiological controls for more than 24 hours. Such events are identified by the DPR monitoring requirements, and this encourages the prompt remediation of spills to minimize reporting. Another commenter argued that rigorous enforcement of existing regulations would achieve the goals of prompt remediation better than additional regulations.

One significant comment from the non-industry stakeholders was that a new rule requiring prompt remediation would maintain residual radioactivity at low levels during operations and reduce the likelihood of a legacy site in the event of early shutdown when decommissioning funds are not fully funded.

During the December 2012 Advisory Committee on Reactor Safeguards review of draft Regulatory Guide 4.22, "Decommissioning Planning During Operations," the Nuclear Energy Institute suggested that the NRC and the industry review the operating experience following implementation of the DPR over a period of one to one and a half years to determine what, if any, changes would be necessary to the rule or the guidance to achieve the goals of the DPR.

Staff Evaluation:

In this notation vote paper, the staff has evaluated the options and is making recommendations on the issue of prompt remediation of residual radioactivity. This notation vote paper also includes the staff's initial analysis of backfit requirements. The options, discussed more fully below, are:

1. Proceed with rulemaking.
2. Do not proceed with rulemaking.
3. Collect 2 years of information (2013-2014) from implementation from the DPR before making a staff recommendation for additional rulemaking.

While the DPR does require licensees to perform surveys (including of the subsurface) that are reasonable to identify significant concentrations or quantities of residual radioactivity, it does not require licensees to conduct remediation during the operational phase of plant life, regardless of the concentration or physical extent of the contamination. During the operational phase of facility life, the contamination has the potential to spread to significantly larger volumes in surrounding media. The staff believes that it is important for licensees to consider the need for prompt remediation in order to avoid future problems resulting from delayed cleanup of contaminated facilities (e.g., increased decommissioning costs, spread of contamination, and dose impacts).

Based on ACNW input and staff evaluation, the staff believes there are several challenges to developing a new rule mandating prompt remediation. The primary considerations are the potential impacts of remediation activities on operational safety and the difficulty of establishing general applicability requirements for the broad range of types of licensees. As ACNW stated,

generic action levels are not necessarily risk-informed and may not apply at different sites. A rule that is too complex to be effectively implemented or enforced would not be consistent with the NRC principles of good regulation: clarity, efficiency, and reliability.

One potentially beneficial alternate approach to reducing the likelihood of future legacy sites would be a new rule enhancing DPR requirements by requiring licensees to develop a written plan of action for addressing radiological contamination. The plan would include actions, cost and schedule for managing contamination that would require remediation at the time of license termination to meet conditions for site release for unrestricted use, including the pros and cons of prompt versus delayed remediation. Facilities implementing the NEI 07-07 voluntary initiative are already performing this type of remediation analysis. However, there is not yet sufficient information from operating experience from implementation of the DPR to determine if it is necessary to supplement the DPR with additional requirements to effectively reduce the potential occurrence of legacy sites.

Concurrently with the effective date of the DPR, the NRC issued Temporary Instruction-2600/017, applicable to licensees other than power reactors, to assist inspectors in evaluating licensee compliance with the DPR. The NRC also issued Enforcement Guidance Memorandum (EGM)-12-02 to allow licensees reasonable time to come into compliance with some new DPR survey and sampling requirements. The staff believes that, as part of Option 3, collecting 2 years of operating experience information on licensee actions under the DPR, calendar year (CY) 2013-2014, will provide sufficient information on which to base a decision regarding staff recommendation on the need for additional regulation or guidance to reduce the likelihood of future legacy sites. The staff is collecting information from site inspection reports about contamination identified by surveys under the DPR and from occurrences of exercise of enforcement discretion. The staff will then identify how licensees responded to such events and determine whether to recommend if additional guidance or regulation is necessary.

Backfit Considerations:

SRM-SECY-12-0046 requires the staff to consider backfit implications of a rule mandating prompt remediation. In general, backfitting means the modification of or addition to systems, structures, components, design, or operation of a facility; or the procedures or organization required to design or operate a facility; any of which may result from a new or amended provision in the Commission's regulations or the imposition of a staff position interpreting the Commission's regulations that is either new or different from requirements in effect at the time of license issuance or initial NRC regulatory approval. A rule mandating prompt remediation would affect the operation of a facility and therefore would be considered backfitting.

However, the NRC's backfitting provisions apply only to facilities licensed under Parts 50, 52, 70, 72, and 76 (~ 150 facilities) comprising less than 1 percent of the more than 22,000 NRC and Agreement State licensees. Moreover, backfitting protects only current licensees and holders of NRC regulatory approvals. The NRC could justify the adoption of remediation requirements on future licensees and future holders of the NRC regulatory approvals under standard regulatory analysis criteria. For this reason, the NRC anticipates that backfitting will not be a deciding factor in determining whether to proceed with rulemaking.

The staff will consider, in any rulemaking approved by the Commission, whether a prompt remediation requirement could be backfit on existing licensees. If a prompt remediation requirement cannot be justified as a backfit on existing licensees, then the regulation could be written to exclude those licensees from having to comply with the prompt remediation requirement (most likely in an applicability provision).

CURRENT OPTIONS:

In response to SRM-SECY-12-0046, the staff identified three options concerning rulemaking mandating prompt remediation. Those options are evaluated below.

Option 1: Propose a Rule on Prompt Remediation

Option 1a: Publish a proposed rule mandating prompt remediation, if practical, and contamination exceeds a fixed calculated dose such as 100 mrem/y.

Pro:

- Provides most assurance of licensee action to reduce the likelihood of future legacy sites.
- Provides a fixed point at which licensee action is required.
- Satisfies some public concern and interests.
- Limits potential doses to the public.

Con:

- Requires licensees to develop and justify a dose model.
- Most residual radioactivity has been found under or near facility systems, structures and components, and remediation would be difficult and could affect safe facility operations.
- Licensees already have incentives to perform remediation when practical: because of requirements to increase decommissioning funding if remediation is not performed, and increased public interest and concern.
- Difficult to develop rule language that meets the NRC principles of clarity and efficiency for wide range of facility types and site conditions.
- Because of backfit constraints, the new rule may not apply to some facilities with high potential for residual radioactivity.
- It may not be useful because response to events causing such a dose may be controlled by other regulations or licensee actions.

Option 1b: Publish a proposed rule mandating that licensees develop a written plan, with cost estimates and schedules to address contamination concentrations that would require remediation to meet unrestricted release criteria at the time of license termination, including the pros and cons of prompt versus delayed remediation.

Pro:

- Provides performance and risk bases for licensee to choose a course of action.

- Contaminant concentrations are routinely measured for compliance with other existing regulations.
- Estimating cost of remediation is required by DPR.
- May be considered as information collection, not modifications, and therefore not subject to the backfit rule.
- Provides written assurance that licensees plan to remediate the site.
- Imposes minimum burden on the NRC and licensees.

Con:

- Licensees already perform cost/benefit evaluations based on their business models and incentives to minimize costs.
- The DPR already requires most licensees to estimate the cost of remediation and adjust their decommissioning funding accordingly.
- Relies on voluntary licensee actions to remediate when practical.
- Those licensees implementing the NEI 07-07 voluntary ground water protection initiative are already performing these types of evaluations.
- May provide very little information beyond what is required by implementation of the DPR, to identify extent of contamination and determine cost to remediate it.

Option 2*:* Do Not Propose Rulemaking on Prompt Remediation

Pro:

- Licensees already have incentives to perform remediation when practical.
- Current regulations require most licensees to adjust financial assurance for remediating significant residual radioactivity.
- Some industry voluntary initiatives already encourage an evaluation of prompt remediation.
- No further NRC or licensee effort.

Con:

- Does not address potential for future legacy sites.

Option 3*:* Collect Information Operating Experience Information from DPR Implementation Before Making a Final Staff Recommendation on Additional Rulemaking

Pro:

- Provides opportunity for an assessment of the effectiveness of existing regulations, including the DPR.
- Provides for an informed recommendation based on actual operating experience, thereby improves the technical and regulatory bases for decision a potential new rule.

Con:

- Postpones decision on rulemaking and response to SRMs.

COMMITMENT:

The staff will meet with stakeholders in the first half of CY 2015 to discuss operating experience information collected on implementing the DPR and determine whether to make a staff recommendation for additional rulemaking.

RECOMMENDATIONS:

The staff recommends Option 3: collect 2 years of operating experience information on DPR implementation before making a final staff recommendation on additional rulemaking. If the staff identifies a need for additional rulemaking on prompt remediation, the staff will prepare a paper discussing the potential scope for Commission consideration.

COORDINATION:

The Office of the General Counsel has no legal objection to this paper.

/RA/

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for Operations

Enclosures:
1. Summary of Public Comments and Staff Evaluation
2. Staff Evaluation of Alternatives to Address Remediation During Operation

Summary of Public Comments on Potential Rulemaking to Address Prompt Remediation of Residual Radioactivity During Operations

Docket ID: NRC-2011-0162

August 15, 2013

Enclosure 1

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STAKEHOLDER COMMENTS	STAFF OBSERVATIONS
Issue 1. General support or opposition to rulemaking	
Issue 1.1. General support without substantive comment	
The Colorado Department of Public Health and Environment (CDPHE), an Agreement State, Congressman John Runyan, who represents the 3rd District of New Jersey, and EnergySolutions provided general support for the potential rulemaking. Congressman Runyan stated that "a rule to require prompt remediation of radioactive contamination is necessary and should be implemented." In addition, a representative of the U.S. Department of Energy's legacy management program thanked the U.S. Nuclear Regulatory Commission (NRC) for their efforts to minimize the number of potential legacy sites requiring long-term management at the expense of the Federal Government. EnergySolutions supported NRC's "well-reasoned rationale" for prompt remediation under certain circumstances.	Staff notes the opinion that additional requirements for remediation during operations are desirable.
Issue 1.2. General opposition without substantive comment	
The Nuclear Energy Institute (NEI) explained that they are not opposed to improvements in the regulatory framework that are properly justified and would simplify decommissioning. However, in NEI's opinion, the rulemaking identified in the Draft Proposed Technical Basis does not constitute such an improvement.	Staff notes the opinion that additional requirements for remediation during operations would not constitute an improvement in the regulatory framework.
Issue 2. Need for a rulemaking	
Issue 2.1. Justifications in support of a rulemaking	
Four commenters made arguments in support of the potential rulemaking. CDPHE, an Agreement State, argued that the nuclear industry should follow the example of related regulations, such as the Resource Conservation and Recovery Act (RCRA) Corrective Action Program. Congressman Runyan noted that the potential rule is significant to his constituents who live around the Oyster Creek Nuclear Generating Station, which has a history of	Staff notes that stakeholders in the vicinity of NRC – licensed facilities that have had significant releases are strongly in favor of additional requirements for remediation during operations.

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tritium leaks, including leaks that have reached the water table. Congressman Runyan emphasized the need for the NRC to address cases where the water table becomes contaminated. EnergySolutions described what they consider to be the two prime reasons to support the prompt remediation rulemaking: (1) addressing contamination that poses a health and safety risk for spreading in the environment and (2) remediating contamination that left unaddressed would complicate or increase the cost of remediating a facility at the time of decommissioning.	
Issue 2.2. Justifications against a rulemaking	
The Union of Concerned Scientists (UCS) stated that new regulations are needed if the NRC does not enforce existing regulations. However, UCS noted that creating a new regulation to solve the problem of not enforcing existing regulations is not a prudent, effective, efficient, or worthwhile fix. In conclusion, UCS requested that the NRC staff explain why existing regulations that address radioactive contamination are not being enforced.	Noted.
Several commenters disagreed with the assertion made in the Draft Proposed Technical Basis that "there are currently no NRC regulations that require licensees to promptly remediate radiological contamination during operations, regardless of the volume or contaminant concentration levels." The commenters cited the following NRC regulations and argued that they are sufficient and effective in preventing legacy sites: • Dose limits contained in 10 CFR Part 20 • As low as reasonably achievable (ALARA) programs required in 10 CFR 20.1101 • 10 CFR Part 40, Appendix A, Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material	Staff maintains its position that currently there are no explicit requirements for remediation during operations in NRC regulations. While the regulations cited in the comment do require licensees to limit exposure to radioactive materials, and contain motivation for keeping exposure below limits, none contain a requirement to use remediation as the means for achieving this. The recent Decommissioning Planning Rule requires licensees to identify the extent of residual radioactivity – that which would require remediation to meet criteria for release for unrestricted use – but the rule does not require remediation prior to cessation of operations.

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From Ores Processed Primarily for Their Source Material Content • General Design Criterion 60 (GDC 60) in Appendix A to 10 CFR Part 50, Control of releases of radioactive materials to the environment • General Design Criterion 64 (GDC 64) in Appendix A to 10 CFR Part 50, Monitoring radioactivity releases • Appendix B to 10 CFR Part 50, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants • 10 CFR 50.34, Contents of applications; technical information • 10 CFR 50.34a, Design objectives for equipment to control releases of radioactive material in effluents – nuclear power reactors • 10 CFR 50.36a, Technical specifications on effluent releases • 10 CFR 50.59, Changes, tests and experiments	Staff notes that Part 50 requirements apply only to nuclear power plants, not the balance of licensees regulated by NRC and Agreement States.
Commenters discussed how existing reporting requirements eliminate the need for the potential rulemaking. NEI stated that NRC regulations (10 CFR 50.75(g) for nuclear power plants, 10 CFR 40.36(f) for source and 10 CFR 30.35 for byproduct licensees, and 10 CFR 70.25(g)(3) for fuel cycle licensees) already require licensees to keep records of information important to the decommissioning of a facility. NEI argued that the potential rule would provide no added benefit because areas that contain residual licensed material do not pose any risk to the public because they are within the licensee's control and oversight and the licensee is subject to the dose limits and standards in 10 CFR Part 20. Similarly, Exelon argued that the potential rulemaking is unnecessary because 10 CFR 50.75 requires that spills and leaks are tracked to ensure that residual radioactivity is cleaned up as part of decommissioning.	Staff notes the industry opinion that existing regulations, including the recent enhancements of the Decommissioning Planning Rule, effectively achieve the stated goal of this potential rule.

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Furthermore, GE Hitachi explained that existing reporting requirements for the fuel cycle industry (in 10 CFR 70.50(b)(1)) encourage prompt remediation of spills. Under these requirements, fuel cycle licensees must report to NRC certain contamination events that lead to over 24 hours of the use of additional radiological barriers or controls to restrict worker or public access to the contaminated area. GE Hitachi explained that for many licensees, this requirement leads to quick remediation of spills so that the licensee can avoid making a report to the NRC.	
Commenters also stated that the potential rulemaking is unnecessary because existing financial responsibility requirements provide ample funding for site remediation at the time of decommissioning, even in cases where a licensee has not remediated leaks/spills during operations. Kennecott Uranium Company and Wyoming Mining Association argued that the stringent financial responsibility standards on uranium mills imposed by 10 CFR Part 40 Appendix A assures that adequate funds will be available for remediation. Exelon argued that the financial responsibility requirements under 10 CFR 50.75 are sufficient because every power reactor that has "ceased operations, and which has been or is currently being decommissioned, has been able to fund and safely perform required decommissioning activities." The commenter concluded that the likelihood of a nuclear power plant becoming a legacy site is extremely low, and the potential rulemaking effort would not reduce this likelihood. NEI also stated that there are no legacy sites under the current regulations. NEI asked that the NRC explain how they have reached a different conclusion.	Industry opinion that current Financial Assurance rules are sufficient to preclude legacy sites; there have not been any new legacy sites since financial assurance rules were enacted in 1988. **Staff notes the view that existing regulations may provide sufficient motivation for licensees to meet the goal of reducing the potential for legacy sites.**

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Similarly, NEI stated that the NRC provided no analysis or meaningful discussion supporting the assertion in the 2013 Draft Technical Basis that the absence of a prompt remediation rule "can result in large volumes of contamination requiring remediation at the time of license termination that may exceed decommissioning funds." GE Hitachi further noted that the implementation of the new decommissioning planning rule strengthened existing financial responsibility requirements. Specifically, the commenter explained that licensees are required to update their decommissioning funding plans on a triennial basis and include estimates for the cost of remediating all contaminated sub-surface soil. Waste Control Specialists, LLC suggested that the NRC hold off on rulemaking until the staff evaluates the impact of the decommissioning planning rule in terms of its effect on the creation of legacy sites.	

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NEI suggested that the prompt remediation rulemaking could create inconsistent and possibly conflicting regulations as licensees implement ALARA programs to control occupational and public doses. NEI argued that any requirement to remediate a site during operation must recognize the options available to licensees under the existing license termination rule, including restricted release criteria.	Noted
NEI argued that the rulemaking is not necessary based on the NRC's 2006 "Liquid Radioactive Release Lessons Learned Taskforce Final Report," suggesting that the cited cases of unplanned and unmonitored radioactive liquid releases to the environment do not impact public health and safety. Therefore, NEI questioned the benefit of the potential rulemaking. NEI also suggested that the following quote from the Draft Proposed Technical Basis implies that the rule is unnecessary: "doses from these releases are generally below the radiation dose limits for operational facilities in 10 CFR Part 20 that would initiate regulatory action (See Draft Technical Basis, at pg. 3)." NEI also cited quotes from the 2013 Draft Regulatory Basis in order to make similar claims against the need for a rulemaking.	Noted
A few commenters noted other groups of regulated entities for whom the potential rulemaking is unnecessary. For example, Council on Radionuclides and Radiopharmaceuticals (CORAR) argued that over the past 50-60 years, radionuclide and radiopharmaceutical manufacturer and distributor licensees have not resulted in legacy sites, and concluded that "both current and previous regulations and license conditions have been adequately protective for this group of licensees." CORAR also recommended that licensees that have perfect compliance records should be exempt from new requirements.	Staff notes that some industry groups feel that past performance should be an adequate basis for exemption from a new rule. Any rule that may be developed would be performance-based. The concept of a prompt remediation rule is that if radiological contamination exceeds some value, the licensees must take some action. If that value is not exceeded no action would be required.

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Similarly, Kennecott Uranium Company and Wyoming Mining Association argued that the potential rulemaking is unnecessary as it applies to the uranium recovery industry because: (1) of the long half life associated with naturally occurring radionuclides, which pose lower risks; (2) operations are conducted in remote areas making radiation exposure to the general public unlikely; (3) contaminant levels associated with naturally occurring radionuclides are difficult to distinguish for background concentrations; (4) the risk associated with natural uranium is not radiological but chemical; and (5) licensees have managed contamination well, and have acted proactively.	Noted
Kennecott Uranium Company and Wyoming Mining Association also argued that prompt remediation is less cost effective than remediation during decommissioning. They suggested that during operations, in addition to the costs of the remediation itself, there would be interruptions to production, and that in some circumstances, remediation of contamination may only be possible after operations have ceased, such as in the case of soil contamination beneath building slabs.	Agree. In addition to cost effectiveness, in its review of the draft rule on decommissioning planning, the Advisory Committee on Nuclear Waste also noted that there could be safety implications to conducting remediation during operations.
NEI argued that the 2013 Draft Regulatory Basis does not provide adequate justification for the contemplated rulemaking and concluded that the development of a proposed rule would therefore be “wholly inappropriate.” Furthermore, NEI noted that moving forward to the proposed rule stage without an adequate basis or meaningful consideration of backfitting implications also would be inconsistent with recent efforts to ensure that the cumulative effects of regulation is appropriately managed by both the NRC and the industry.	Noted

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Issue 3. Proposed triggers requiring consideration of prompt remediation	
Issue 3.1. Concentrations	
NEI recommended that the NRC consider allowing licensees the option of establishing site-specific derived concentration guideline levels (DCGLs). Similarly, Enercon stated that licensees should be allowed to use the Residual Radioactivity (RESRAD) code to calculate site-specific DCGLs.	Agree the potential rule should allow for such an approach.
Two commenters stated that the sample point can impact the concentration detected and therefore question whether or not concentration thresholds are appropriate. An NRC commenter asked what sample point should be used, and what the concentration value would be measuring (i.e., the fluid leaking into the ground, or some other sampled concentration). Exelon stated that by setting "concentration thresholds, there could always been some kind of a mismatch depending on say how deep the contaminant is in the soil." A commenter recommended that the NRC consider how concentration thresholds will be applied based on site-specific characteristics. Exelon also recommended that the NRC tie concentration limits to subsurface flow speeds and directions.	These comments would be addressed during rulemaking, either in the rule language or, more likely, in the guidance document.
EnergySolutions argued that the NRC has not provided, nor does there exist, a justification or basis for the imposition of new concentration limits that would trigger prompt remediation.	
Issue 3.2. Dose limits	
NEI stated prompt remediation triggers should be tied to the dose limits in the license termination rule (Subpart E to 10 CFR Part 20).	Staff does not necessarily agree that prompt remediation limits should be the same as license termination limits.
CDPHE, an Agreement State, stated that they oppose a strict reliance on dose as a criterion for pursuing cleanups because "chronic leaks can contaminate large areas without exceeding a dose limit."	Staff agrees with this opinion.

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Exelon suggested that if a dose-based calculation is chosen, it may be helpful if NRC and licensees use a common code like RESRAD so that radiation analyses would produce similar results.	Staff agrees that there should be a common basis for dose calculations.
A commenter from the NRC questioned how dose contributions from multiple or ongoing leaks would be calculated. The commenter asked if licensees would need to maintain records that sum total expected dose.	This comment points out one of the complications of using dose as a basis for action. Others include accounting for time differences in spill/leak occurrences and defining who will be exposed when and how (pathways).
EnergySolutions argued that the NRC has not provided, nor does there exist, a justification or basis for the imposition of new dose limits that would trigger prompt remediation, reasoning that dose limits already exist to protect workers and members of the general public.	Noted
Issue 3.3. NRC screening criteria	
CDPHE, an Agreement State, recommended that the NRC screening criteria could be an appropriate trigger for the consideration of prompt remediation.	Staff believes that screening values, which equate to 25 mrem/y for conservative exposure scenarios, may not be appropriate limits for specifying remediation during operation.
NEI argued that the NRC screening criteria are inappropriate triggers if the goal is to avoid legacy sites. NEI suggested that the NRC screening criteria are conservative, generic screening values designed to be used at simple sites, and these criteria are more restrictive than site-specific decommissioning criteria developed by individual licensees.	Staff agrees with this comment. Screening criteria should be applied only to release for unrestricted use at the time of license termination.
NEI and Entergy both argued that different dose methodologies are used to calculate NRC screening criteria and Environmental Protection Agency (EPA) maximum contaminant levels (MCLs), and do not collectively form a coherent regulatory approach. Specifically, both commenters stated that the DCGLs are based on the more recent International Commission on Radiological Protection (ICRP) 30 methodology while MCLs are derived from ICRP 2.	Staff agrees that NRC and EPA use different methodologies. While an early consideration, MCLs are not currently being considered as trigger points for prompt remediation.

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Issue 3.4. EPA's maximum containment levels	
CDPHE, an Agreement State, stated that EPA's MCLs could be an appropriate trigger, but many constituents do not have MCLs. Therefore, CDPHE suggested reliance on the limits in 40 CFR Part 264, Appendix IX.	MCLs are not currently being considered as trigger points for prompt remediation. Values in Table 2 of Appendix B to Part 20 that contain a list of radionuclides are an option being considered.
Several commenters, including Ameren, NEI, and Nuclear Fuel Services (NFS), noted that the EPA MCLs strictly apply to drinking water and question how relevant these standards may be to groundwater beneath an industrial facility, which is not used in the public drinking water supply.	Agree
NEI argued that EPA's MCLs are an inappropriate trigger. Specifically, NEI stated that MCLs are indicative of dose levels that are a small fraction of 25 millirem in a year. NEI argued that it is unreasonable to apply more conservative remediation thresholds (i.e., EPA's MCLs) during plant operation than would be required at decommissioning and release of a site.	Agree
Entergy recommended that the NRC derive concentration limits for water based on a dose consequence of 25 millirem per year total effective dose exposure using ICRP 30 or ICRP 72 dose factors.	25 mrem/y, the criterion for release for unrestricted use, may be too conservative for use in prompt remediation.

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NEI and Waste Control Specialists, LLC, stated that using EPA's MCLs as a trigger for prompt remediation may be a major and unwarranted shift in Commission policy. Specifically, during development of the license termination rule, the Commission considered and rejected incorporation of EPA's MCLs into the rule. NEI noted that although the NRC agreed to use the MCLs as triggers that would require consultation with EPA, the Commission declined to incorporate those pathway-specific limits into the license termination rule, concluding that the all-pathways, dose-based standards in Subpart E are protective of public health and safety.	Agree
Issue 3.5. Other threshold limits	
NEI recommended that licensees should be able to develop site-specific thresholds.	Any rule would contain provision for performance-based actions.
NFS asked if licensees would be able to conduct a comprehensive risk assessment for all contaminates of concern in lieu of using MCLs.	Use of comprehensive risk would be acceptable to NRC.
CORAR recommended that guidance documents identify acceptable threshold limits that are based on current assessment tools developed by the interagency steering committee on radiation standards using up-to-date ICRP recommended dose conversion and weighting factors in conjunction with the ALARA principle.	Guidance on any rule uses current NRC dose standards.
Issue 3.6. Other comments relating to triggers requiring consideration of prompt remediation	
The Department of Veterans Affairs asked if the NRC is considering thresholds for surface contamination, for example building surfaces.	
Waste Control Specialists, LLC asked if NRC is considering specific license conditions that would be tied to an environmental monitoring program that identifies investigation levels, action levels, and regulatory limits which, when exceeded, would trigger	One option staff is considering is a formal NRC policy to amend licenses as necessary to address site-specific conditions.

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remediation.	
Radiation Safety and Control Services (RSCS) stated that regardless of the threshold limit set, NRC should consider the use of a comprehensive sampling strategy (i.e., The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)), rather than relying on an individual sample.	The Commission has historically not required a MARSSIM approach for purposes of remediation during operations. Staff agrees that MARSSIM exceeds the intent of such a rule and would be an unnecessary burden on licensees. However, staff agrees that a single sample may not be a sufficient basis for action.
NFS asked if NRC is considering a site-specific standard or background-corrected standard for both soil and groundwater.	
Issue 4. Justifying delayed remediation	
Issue 4.1. General support for allowing justification analysis	
NEI and EnergySolutions provided general support for allowing licensees to justify delaying remediation under certain conditions.	
Issue 4.2. General opposition to allowing justification analysis	
No comments were associated with this issue.	
Issue 4.3. Elements of the analysis to justify delayed remediation	
Issue 4.3.1. Dose-assessment/risk-assessment	
Several commenters stated that dose-assessment should be an element of the analysis to justify delayed clean-up of a site. NEI stated that the analysis should include consideration of the potential for off-site migration of the licensed material that would result in a dose to a member of the public above the existing regulatory limit in 10 CFR Part 20. NEI also suggested that the analysis should identify the actual receptors and dose pathways. CORAR stated that the analysis should determine potential dose to operations staff and the potentially affected community. Finally, another commenter stated that minor spills that are in a high radiation dose area should qualify for delayed cleanup based on a dose-benefit analysis.	Staff agrees with these comments. The comments also illustrate some of the complexities in performing a meaningful dose analysis.
EnergySolutions stated that a licensee should be obligated to justify delaying remediation by performing a risk analysis that	

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addresses the prospect of "the spread of contamination over time." EnergySolutions suggested that the basis for taking action given the results of the risk analysis should consider: (1) Does the contamination pose the prospect for a violation of existing NRC regulations; and (2) If not, how if at all would the contamination complicate the future remediation of the site at the time of decommissioning?	
Issue 4.3.2. Cost-benefit analyses	
Two commenters stated that cost-benefit analysis should be an element of the analysis to justify delayed remediation of a site. One commenter stated that minor spills in a high radiation dose area should qualify for delayed remediation based on a cost-benefit analysis. Dominion stated that cost-benefit analysis should be considered, but argued that delayed remediation would not affect a licensee's financial risk.	Staff agrees that cost/benefit is an important factor. One challenge is defining the benefits. Two possible benefits are limiting worker dose and reducing future remediation liability. It is not obvious how to compare present and future exposure. There are potentially significant uncertainties in financial costs also, such as unit disposal cost as a function of disposal capacity.
EnergySolutions recommended that a risk analysis be combined with a cost-benefit analysis in circumstances where the contamination is not likely to result in a violation of NRC regulations. Under those circumstances, EnergySolutions suggested that the licensee perform a cost-benefit analysis "to compare the advantage of prompt remediation with deferring remediation until the time of decommissioning." EnergySolutions concluded that the results of the cost-benefit analysis would determine if prompt remediation is justified.	
Two commenters raised concerns about the public availability of such cost-benefit analyses. A commenter from the NRC asked if the cost-benefit analysis justifying delayed remediation would be available for public comment. A commenter from Dominion argued that the cost-benefit analysis should not be publicly available if it contains financial information that is confidential or sensitive.	Decommissioning cost estimates are traditionally available to the public. NRC can keep certain licensee financial information proprietary. Licensees would need to provide appropriate justification per 10 CFR 2.390 to withhold the information.

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Issue 4.3.3. Other assessment of analysis	
CORAR stated that the components of a justification analysis will depend on the circumstances of each occurrence. CORAR also stated that licensees have processes in place that affect the timing of corrective and preventive actions and could affect the decision to delay remediation.	Agree
Exelon and Ameren stated that the risk associated with recapture, a potential pathway for future contamination, should be considered in the analysis.	Agree with this insight.
Issue 4.4. Criteria considered to justify delayed remediation	
	Staff agrees with the comments in this section that collectively illustrate the complex range of issues any proposed rule would have to address.
Issue 4.4.1. Safety	
NEI, CORAR, Exelon, EnergySolutions, and another commenter stated that safety should be a criterion considered in a licensee's decision to delay remediation. Exelon recommended that if residual radioactivity is limited to the owner-controlled area, then the impact on the health and safety of the public would be minimal. Therefore, the commenter argued that delaying remediation would be justified. Another commenter stated that large spills within the plant should be cleaned up to free releasable levels at the next scheduled plant shutdown.	
Issue 4.4.2. Operational impact	
Exelon, Enercon, NEI, CORAR, and EnergySolutions stated that operational impacts should be a criterion considered in a licensee's justification for delayed remediation. Exelon explained that operational impacts must be evaluated because they can make prompt remediation impractical. RSCS indicated that the NRC should consider how soil contamination below buildings will be addressed in comparison to contamination in soil not	

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impacted by the operations of the facility.	
CDPHE, an Agreement State, stated that operational impacts should be a criterion considered in a licensee's justification for delayed remediation and noted that logistical considerations relative to remediation in areas of ongoing operations should not preclude prompt remediation. CDPHE argued that "the burden must be on the licensee to demonstrate why cleanup should not be done."	

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Issue 4.4.3. Cost	
CORAR, Exelon, NEI, Westinghouse, and EnergySolutions stated that cost should be a factor considered in a licensee's justification for delayed remediation. CORAR specified that cost-effectiveness should be considered. NEI stated that the cost to customers should be considered in the analysis. Westinghouse stated that the timing of remediation may be dependent on the financial hardship that the remediation would cause. In support of its argument that cost should be the principal justification for delaying remediation, EnergySolutions referenced what the commenter described as the NRC's five reasons to support the proposed rulemaking from the Draft Technical Basis and argued that each refers to the potential lack of resources or funds that may be needed to complete remediation at the time of decommissioning. EnergySolutions concluded that since the NRC is justifying the rule largely on the basis of cost, that cost should play a predominant role in determining the timing of remediation. NEI argued that "absent any dose implications or risk to public health and safety," remediation should be a business decision. In addition, NEI asked the NRC for more information on the timeframe for estimating remediation costs. Specifically, NEI explained that current disposal, labor, and transportation costs can be used to estimate prompt remediation costs, but remediation costs at the time of decommissioning is difficult to estimate. NEI also recommended that the NRC consider the financial implications for requiring prompt remediation during operation because prompt remediation could result in costs being incurred for remediation during operation as well as during decommissioning for cleaning up the same area.	

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CORAR suggested that the cost of prompt remediation is normally considered as a contingency in planning new operations with licensed materials, in decommissioning cost estimates, and when residual contamination is calculated. CORAR further explained that licensees are prepared to spend more to promptly remediate to prevent a significant impact, adverse perception, or a business interruption.	Noted
Issue 4.4.4. Other conditions	
NEI and CORAR recommended considering the following criteria: (1) normal radioactive decay, (2) contaminant characteristics, (3) the likelihood that the radioactive material will leave the site during operations, and (4) the ability to monitor and track the contaminants.	Noted
NEI recommended considering: (1) whether there is an actual receptor for the radioactive material, (2) ALARA, (3) operational impacts, and (4) compliance with existing regulatory requirements (i.e., licensees should be able to defer remediation if they can demonstrate that they have met regulatory requirements and shown that the contamination will not exceed public dose limits in 10 CFR Part 20 and that contamination in excess of applicable limits will not migrate off-site prior to decommissioning actions).	Noted
CORAR stated that the cause of the contamination and whether it is historic, ongoing, or potential should be considered. In addition, the commenter recommended that the potential environmental and public impact should be considered.	Noted
Westinghouse stated that the likelihood of recontamination should be considered.	Noted
CDHPE suggested that impacts to financial assurance should be added to the list of factors to consider in the analysis to justify delayed remediation.	Noted

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Issue 4.5. Other comments on justification for delaying remediation	
CORAR stated that the justification analysis should be documented and evaluated by "appropriately qualified individuals."	
Issue 5. Other comments on issues raised in Draft Technical Basis or Draft Regulatory Basis	
Issue 5.1. Alternatives considered	
	Staff notes that many commenters state that utilizing existing regulations and addressing issues on a site-specific basis is preferable to issuing a new, broad rule.
NEI supported an alternative to rulemaking that would clarify existing requirements related to public and occupational exposures. NEI supported this alternative by arguing that current regulations require licensees to perform surveys to ensure the control of licensed materials and to ensure adequate funds are available to perform decommissioning to meet the license termination rule.	
CORAR supported an alternative to rulemaking in which the NRC would issue site-specific license conditions for individual licensees. CORAR argued that only a few material licensees have caused contaminated legacy sites (i.e., facilities that processed uranium and transuranics). CORAR recommended that these licensees should be held accountable through license conditions. A commenter from Westinghouse raised similar concerns with a "one size fits all" rulemaking.	
CDPHE, an Agreement State, favored the rulemaking alternative that does not provide licensees with the opportunity to conduct an analysis to justify delayed remediation.	Noted
Other commenters expanded upon the alternatives included in the Draft Proposed Technical Basis. For example, UCS argued that instead of a rulemaking, NRC should consider enforcing existing regulations. CORAR advised NRC to consider licensing,	

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inspection, and enforcement alternatives. A commenter from Arizona Public Service suggested a phased approach to remediation, rather than an "all or nothing clean-up" standard.	
EnergySolutions stated that the NRC had considered alternatives "sufficient to bound the problem."	
Issue 5.2. Preferred alternative	
According to the 2013 Draft Regulatory Basis, the NRC's preferred approach is to require licensees to evaluate site conditions and to establish and document a risk-informed course of action. The regulatory basis recommends the concentrations for effluents listed in Appendix B to Part 20 as the preferred action level associated with ground water contamination, beyond which licensees would be required to perform an evaluation that may result in a requirement to perform prompt remediation. NEI questioned how the NRC had determined that the concentration values in Appendix B to Part 20, which NEI describes as applicable to liquid radioactive releases to a receiving body of water, are appropriate for release to on-site ground water.	NRC considered several trigger levels related to prompt remediation. One was the public exposure limit of 100 mrem/y; another was the release limits for unrestricted use of 25 mrem/y. Staff evaluation determined that neither of these were appropriate for the purpose of requiring remediation during operations. Table 2 of Appendix B to Part 20 defines concentrations of fluids that equate to 50 mrem/y, assuming direct consumption. If such concentrations were to exist on site at the time of license termination, licensees would be required to remediate them to meet the limits for release for unrestricted use (25 mrem/y), therefore they may serve as useful trigger points for remediation during operations.
EnergySolutions stated that it supports the NRC's preferred approach.	

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Issue 5.3. Other comments on 2011 Draft Proposed Technical Basis	
Three commenters stated that the Draft Proposed Technical Basis did not provide sufficient evidence that a rulemaking is necessary. NEI stated that, "the Draft Technical Basis does not provide sufficient information on the potential for the creation of legacy sites, given the current regulatory framework." Furthermore, NEI suggested that the Draft Proposed Technical Basis does not provide a clear delineation of the problem that the NRC seeks to address. Similarly, EnergySolutions requested empirical data to support the Draft Proposed Technical Basis. A commenter from Arizona Public Service recommended that the NRC consider the factors that might lead to a future legacy site in order to define the scope of these regulations. NEI also requested that the NRC provide examples of cases where delayed remediation has led to relaxed safety practices due to changes in key staff and management focus. (NOTE: this is discussed in the 2011 Draft Proposed Technical Basis)	Additional information will be provided during any rulemaking activities, for example in Statements of Consideration or a revised regulatory basis document.
Issue 5.4. Other comments on the 2013 Draft Regulatory Basis	
GE Hitachi asked if and how public comments received in response to the 2011 Draft Proposed Technical Basis had been considered in the ongoing process recently resulting in the 2013 Draft Regulatory Basis.	The draft Regulatory Basis is an analysis to support development of a draft rule. The comments on the 2011 draft were used to further develop the alternatives identified.
NEI argued that the 2013 Draft Regulatory Basis was insufficient to support a rulemaking requiring prompt remediation during operations. NEI suggested that: • The Draft Regulatory Basis assumes a rulemaking is required by the Commission, rather than meaningfully assessing the need for new requirements. • The Draft Regulatory Basis fails to identify a specific problem requiring a regulatory solution.	

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• The Draft Technical Basis does not include a cost/benefit analysis or a discussion of the backfit implications of the rulemaking.	
NEI recommended that the regulatory basis should examine the need for a rulemaking by acknowledging the current regulatory framework, then analyzing licensee performance subsequent to the establishment of decommissioning financial assurance requirements (1988 to present).	
EnergySolutions stated that no other issues needed to be considered in developing a technical basis for a rulemaking to address prompt remediation of residual activity during the site operations.	
Issue 6. Public webinar feedback	
Six commenters provided positive feedback about the 2011 public webinar and encouraged NRC to continue to use such a forum. Within those six comments, two recommendations were made for improvement: (1) provide an audio web feed in addition to the call-in number, and (2) provide slides in advance or concurrently with the webinar.	Staff notes a range of opinion on use of webinars in lieu of face-to-face meetings.
Commenters expressed dissatisfaction with the 2013 public webinar. NEI stated that stakeholders had fewer than the standard 10 day notice period for the webinar. Dominion stated that a lack of participation in the webinar may be due to conflicting start times that were advertised in the *Federal Register* Notice and on the Public Meeting Notice provided on the NRC website. NEI also requested another public meeting later in July and expressed a preference for a forum allowing easier discussion between staff and stakeholders.	The webinar was announced May 23, 2013, on NRC Meeting Notice page. Letters to stakeholders were sent on May 28, 2013. Slides are available in ADAMS with Meeting Notice dated May 28, 2013 for the meeting on June 3, 2013. There was a 1 hour difference in times for the start of the meeting in the Meeting Notice and the FRN. However, staff was available the whole time. Agree the conflict may have affected participation. Additional public meetings will occur as part of any rulemaking effort by NRC.

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NEI requested another public comment period if the NRC continues its consideration of a prompt remediation rulemaking and develops a more thorough analysis of the need for new requirements, including backfitting implications.	
Issue 7. Other comments on potential rulemaking	
Several commenters (Entergy, Exelon, NEI, and RSCS) requested that the NRC clarify the term "prompt." These commenters asked how much time could pass in order for remediation to be considered "prompt."	There is not a firm definition of "prompt" at this time. Any proposed rule would have such a definition. In general, prompt is considered to be consistent with what is referred to as the "Timeliness Rule," (see e.g. §40.42(d)) which states action should generally begin within 1 year.
NEI questioned if active remediation would be required under the potential "prompt remediation" rulemaking or if the licensee would be permitted to utilize "monitored attenuation." In addition, NEI indicated that characterization of the plume and identification of the source could take a year or more to complete.	If a licensee can demonstrate that current radiological contamination would not require remediation at the time of license termination to meet criteria for release for unrestricted use, this potential rule would not require prompt remedial action. Reasonable time to define the extent of contamination and remedial actions would be allowed.
Exelon asked if the potential rulemaking would apply to historic releases.	The DPR, or NEI-07-07 for NPPs, requires surveys under §20.1501. The proposed rule would apply to current site conditions.
Dominion asked if decommissioning trust funds could be used to cover the cost of required remediation under the potential rulemaking.	No. For NPPs, §50.82(a)(8) specifies use of the decommissioning trust fund. The amount specified in §50.75(c) does not include spills and leaks. For other licensees, the value of the fund may be adjusted to reflect the estimated cost of remediation at the time of license termination, but funding for remediation during operations must come from other sources.
An NRC commenter asked if the potential rulemaking would affect the requirements under Section 50.75(c)(2) to reflect the impact of leaks on projected reactor decommissioning funding requirements.	No, nothing in this potential rule would affect §50.75.

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The Illinois Emergency Management Agency and the Washington Department of Health, both of which are Agreement States, questioned the potential applicability of the rulemaking. The Washington Department of Health inquired whether the rule would be limited to the nuclear power plant industry or to all NRC licensees. The Illinois Emergency Management Agency asked whether the rulemaking would apply to material licensees.	In general, the potential rule would apply to all license types. The exact rule language would undergo an evaluation for backfit requirements.
Exelon and CDPHE, an Agreement State, suggested that NRC look to existing clean-up programs and guidance including Superfund and RCRA to inform the potential rule.	Staff agrees.
	Staff notes that the fiinal guidance (RG 4.22) on the DPR was issued in Dec 2012.
Commenters from the Illinois Emergency Management Agency - an Agreement State, Arizona Public Service, and EnergySolutions, all raised concerns about the implications of the potential rule on agreements worked out with State agencies.	Staff does not anticipate that any agreements would preclude prompt remediation of radiological contamination on an NRC-licensed site. If such an issue arises, it can be addressed at that time.
Issue 8. Out of scope	
Westinghouse sought clarification on the decommissioning planning rule requirements, specifically with regard to the survey plan (i.e., does it need to be approved by the NRC) and the required level of detail within these survey plans.	Regulatory Guide 4.22 gives guidance on surveys. NRC does not need to approve plans for surveys conducted during operations. Inspections will evaluate the adequacy of §20.1501 surveys.
The Vermont Department of Health, an Agreement State, suggested that State's rights might need to be considered because groundwater is a resource of the State.	Any rulemaking working group would include representatives from Agreement States.
CORAR recommended that the NRC develop guidance that shows "how it is cost-effective and risk-informed for many groups of licensees who have never created a contaminated legacy situation to routinely use limited resources to make hydro-geologic evaluations to determine effective sampling and analysis."	The scope of sampling was addressed in the Decommissioning Planning Rule (§20.1501) and its associated guidance, RG 4.22, "Decommissioning Planning During Operations." Subsurface sampling is necessary only where it is reasonable to expect subsurface contamination.

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Congressman Runyan noted that “radioactive leaks from corroded underground piping remain a serious concern. While prompt remediation would address the leaks, it would not address the root problem of corroded underground piping. It is likely that leaks will get worse as our infrastructure ages.”	This proposed rule would not address component, system and structure performance; however, other regulations do so.

STAFF EVALUATION OF ALTERNATIVES TO ADDRESS REMEDIATION DURING OPERATIONS

Staff experience in the decommissioning of nearly 100 sites demonstrates that unremediated contamination, especially in the subsurface, can, over time, migrate and contaminate parts of the surrounding area and resources. This has potential to increase costs and increase the potential for legacy sites. In addition, bankruptcy, corporate restructuring, or other unforeseen changes in the company's financial status may create complex decommissioning challenges that could further delay remediation or lead to legacy sites. For example, relocation of personnel may contribute to loss of institutional memory, particularly of spill and on-site disposal locations, which can increase costs to identify them and delay cleanup. As a result, the U.S. Nuclear Regulatory Commission (NRC) staff has explored policy options to require licensees to promptly remediate contamination when certain criteria are triggered.

Staff evaluated existing regulatory requirements to determine if sufficient requirements existed to prevent occurrence of more legacy sites in the future. In summary, the Commission has statutory and regulatory authority to require licensee action when it is necessary to protect health and safety. Regulations at 10 CFR Part 20 define dose limits to members of the public and workers from nuclear facilities. While these regulations set limits on exposure, they do not explicitly require remediation of radiological contamination. Licensees could limit exposure to the public and workers by imposing time or distance limits to the contaminated areas. By adding to the principle of maintaining doses as low as reasonably achievable (ALARA), licensees endeavor to keep doses below regulatory limits. However, there is no current regulatory requirement to remediate during operations significant levels of residual radioactivity that could require remediation at the time of decommissioning. Only when a licensee seeks to terminate the NRC license does the License Termination Rule specify that residual radioactive contamination must be reduced – remediated – to limit calculated doses. Having large volumes of residual radioactivity at the time of license termination could lead to a legacy site. The following table summarizes arguments for and against the need for a new prompt remediation rule.

SUPPORTS A NEW RULE	DOES NOT SUPPORT A NEW RULE
➢ Remediation during operations is not currently required. This can result in large volumes of contamination requiring remediation at the time of license termination that may exceed decommissioning funds.	➢ Existing exposure limits provide adequate protection for public health and safety during operations. The Decommissioning Planning Rule (DPR) requires early identification of existing "significant residual radioactivity" and timely adjustment to decommissioning funding to remediate it at license termination.
➢ Some sites have large volumes of contamination from long-term leaks/spills and contaminant migration with insufficient resources to remediate to release criteria at license termination. Remediation during the operational phase could moderate this situation.	➢ Current regulations are sufficient to ensure adequate site characterization and resources, including funding, to complete decommissioning at the time of license termination.
➢ A rule could explicitly require remediation to implement ALARA during operations. This could reduce the cost of remediation at license termination, and thereby the likelihood of occurrence of legacy sites in the future.	➢ Current financial assurance regulations are sufficient to ensure adequate resources to complete decommissioning. The DPR now requires licensees, except power reactors, to provide a new Decommissioning Funding Plan (DFP) within 1 year. No new legacy sites have been identified since the 1987 Financial Assurance regulations. No power reactors have been legacy sites.
➢ Prompt remediation could minimize the amount of contamination, and cost, to remediate.	➢ Mandated remediation during operations could adversely impact operational safety and flexibility.
➢ Maintaining residual radioactivity at low levels during operations could reduce the likelihood of a legacy site in the event of early shutdown, especially where decommissioning funding plans are not fully funded.	➢ Prompt remediation during operations may result in licensees remediating the same area multiple times during plant life, thereby increasing operational costs.

While no legacy sites have occurred since institution of financial assurance rules in 1988, some sites have experienced decommissioning costs significantly greater than the value of the decommissioning fund; this condition has the potential to create new legacy sites. Licensees are currently required to measure concentrations in soil and ground water by the Decommissioning Planning Rule, expressed in 10 CFR 20.1501, and to calculate doses to potentially exposed individuals to demonstrate compliance with the limits of §§20.1201 and 20.1301.