

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY  
AND SAFEGUARDS  
WASHINGTON, DC 20555

May 9, 2016

**NRC REGULATORY ISSUE SUMMARY 2016-06  
NRC REGULATION OF RADIUM-226 UNDER MILITARY CONTROL AND FOR  
COORDINATION ON CERCLA RESPONSE ACTIONS AT DOD SITES WITH RADIOACTIVE  
MATERIALS**

**ADDRESSEES**

All Agreement State Radiation Control Program Directors and State Liaison Officers; all Radiation Control Program Directors and State Liaison Officers; U.S. Department of Defense's (DoD's) Director of Environment, Safety and Occupational Health; all U.S. Air Force and U.S. Navy master materials license (MML) contacts; all U.S. Army contacts with specific U.S. Nuclear Regulatory Commission (NRC) licenses.

**INTENT**

The NRC is issuing this regulatory issue summary (RIS) for three purposes. First, this RIS clarifies which discrete sources of radium-226 under military control are subject to NRC regulation as byproduct material under the Atomic Energy Act of 1954, as amended (AEA). This RIS clarifies the discussion of the NRC's jurisdiction over radium-226 under military control in the NRC final rule "Requirements for Expanded Definition of Byproduct Material" (published in the *Federal Register* (FR), 72 FR 55864 (October 1, 2007)) (NARM Rule). Additionally, this RIS describes regulatory approaches to implement the NRC's authority over contamination and items and equipment containing naturally occurring and accelerator-produced radioactive material (e.g., radium-226) at military sites. Further, this RIS describes the NRC and DoD's coordination and agreement on Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) response actions at military sites with unlicensed AEA byproduct, source, or special nuclear materials under a Memorandum of Understanding (MOU) dated April 28, 2016.

**BACKGROUND INFORMATION**

The Energy Policy Act of 2005 (EPAct) expanded the AEA's definition of byproduct material to include discrete sources of radium-226, discrete sources of naturally occurring radioactive material, and accelerator-produced radioactive material for use for a commercial, medical, or research activity (collectively, these materials are referred to as NARM). The NRC has received inquiries from different branches of the military requesting clarification of the scope of the NRC's jurisdiction over NARM. Section 651(e)(3)(A) of the EPAct (11e.(3)(A) of the AEA; 42 U.S.C. 2014(e)(3)(A)) amended the definition of byproduct material to include "any discrete

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source of radium-226 that is produced, extracted, or converted after extraction, before, on, or after [August 8, 2005,] for use for a commercial, medical, or research activity.” Neither the EPA Act nor the AEA define the term “discrete source.” The NRC established by regulation a definition of the term “discrete source” to be used for the purposes of the new definition of byproduct material. Discrete source is defined at Title 10 of the *Code of Federal Regulations* (10 CFR) sections 20.1003, 30.4, 110.2, and 150.3 as “a radionuclide that has been processed so that its concentration within a material has been purposely increased for use for commercial, medical, or research activities.” In addition, the statements of consideration (SOC) for the NARM Rule noted that “once a discrete source meets the definition of byproduct material, any contamination resulting from the use of such discrete sources of this byproduct material will also be considered byproduct material” (72 FR 55871).

As explained in the SOC for the NARM Rule, the Commission’s interpretation of the EPA Act is that the NRC has jurisdiction only over those discrete sources of radium-226 used by the military in medical or research activities or in a manner similar to a commercial activity. The NRC does not have jurisdiction over radium-226 used by the military in military operations because, as the NRC noted in SOC for the NARM Rule, to do otherwise would “vitiating any distinction that the EPA Act intended to make for military use...” (72 FR 55867). The SOC clarified that the military use exclusion in the EPA Act only applies to a certain type of military use: military operations. Military operations includes that which is traditionally understood as the military’s primary mission for national defense, i.e., warfare, combat, battlefield missions, and training for such missions. The term military operations also includes “material still under control of the military, i.e., in storage, or material that may be subject to decontamination and disposal.”

The SOC provided that the NRC would interact with DoD to obtain a common understanding of the uses of discrete sources of radium-226 and resolve any potential conflicts on a case-by-case basis (72 FR 55867). Consequently, the NRC staff had numerous interactions with DoD on this matter. The NRC and DoD discussed the historical uses, current military activities, and management of discrete sources of radium-226. Through these interactions, it became apparent to the staff that there is uncertainty over the precise meaning and scope of the phrase “material still under control of the military, i.e., material in storage, or material that may be subject to decontamination or disposal.” This uncertainty has led staff to believe that a generic communication is required to ensure that NRC regulations are appropriately implemented.

On February 16, 2011, the NRC staff prepared a Commission paper that discussed the military’s uses of radium-226, identified issues, and recommended approaches to clarify and implement the NRC’s regulatory jurisdiction over certain types of military use of radium-226 (SECY-11-0023, “Jurisdiction for Military Operational Radium-226,” ADAMS Accession No. ML110110345). On March 24, 2011, the Commission responded to the staff’s recommendations in SECY-11-0023 by approving publication of a draft guidance document that would clarify these issues (SRM-SECY-11-0023 (ADAMS Accession No. ML110830952)). On July 8, 2011, the staff published its draft guidance, in the form of a draft RIS, in the *Federal Register* (76 FR 40282) for public comment. Enclosure 1 provides summaries of the public comments received and the NRC staff’s responses.

## SUMMARY OF ISSUE

This RIS addresses the following issues: 1) clarification of radium-226 under military control that is subject to NRC's jurisdiction and 2) acceptable regulatory approaches to and implementation of the NRC's jurisdiction. Benefits resulting from this RIS and the MOU approach are also described.

### Issues Addressed in this RIS

#### 1) Clarification of NRC Jurisdiction Over Certain Types of Radium-226 under Military Control

This RIS clarifies that if radium in the military's possession is **not** used in or intended for use in military operations, then it is subject to the NRC regulations. The NRC very specifically discussed the scope of this expanded radium jurisdiction in the SOC, paying close attention to its effect on DoD. The NRC has authority under Section 651(e)(3) of the EPAct over certain military radium uses and not others. The exclusion from the coverage of the EPAct only applies to a certain type of military use, i.e., NARM used for military operations. As the NRC stated in the SOC to the NARM Rule, if "[radium-226] is **intended** for use in military operations, it is excluded from coverage of this rule..." (72 FR 55867) (emphasis added). If the military does **not** use or does **not intend** to use radium under its control in military operations, then this radium is subject to the NRC's regulatory authority.

With respect to material in storage or material that may be subject to decontamination and disposal, radium in the military's control that the military intends to use in military operations is excluded from the NRC's regulatory authority. Items and equipment in storage that the military does not intend to use for military operations are subject to the NRC's regulatory authority. This clarification does not change the NRC's previously adopted regulatory framework.

Military radium-226 that originated from a commercial supplier is byproduct material, except during its use by the military in traditional military operations. When the military is no longer using commercially produced radium-226 for traditional military operations and does not intend to use the radium for traditional military operational use in the future, then the radium-226 is subject to NRC's regulatory authority. The SOC statement that contamination resulting from degradation of byproduct material will also be considered byproduct material (72 FR 55871) will, therefore, apply to military radium-226 contamination because this radium-226 is no longer being used or intended for use in military operations. For example, degradation of buried markers can result in contamination of the surrounding soil or ground water. This contamination is not considered military operational use. In addition, the storage of material or equipment not intended for future military operations, removal of dials and gauges after their usable life, and remediation of radium-226 contamination are similar to commercial activities and thus are subject to NRC's regulatory authority. This clarification is consistent with the NARM Rule SOC statement that material that "has been used...in a manner similar to a commercial activity, e.g., military museums, is covered by the EPAct and [the NARM] rule" (72 FR 55867).

This clarification is consistent with the definition of byproduct material in the EPAct and the NRC's regulations. The above clarification is also consistent with the NRC's practice of regulating other military radioactive material, except when the material is used in traditional military operations.

To further clarify, the following specific categories of discrete sources of radium-226 under military control are subject to the NRC's regulatory authority:

- Contamination

Examples include contamination in structures; soil; ground water; sewers or storm drains; and degraded devices and residue from radium paint shops buried in landfills. For the purposes of determining NRC's jurisdiction over radium-226 contamination on DoD sites, the NRC distinguishes "confirmed" and "suspected" contamination. The term "confirmed" is used for "known" contamination and the term "suspected" is used for "potential for" contamination. Contamination can be confirmed based on a wide range of data, including:

- 1) very limited data that provides the basis for further investigation
- 2) limited data that can be reasonably extrapolated to a larger area such as a burial site or landfill or sewer lines with limited access for sampling
- 3) extensive survey or sampling data considered representative of an entire area

Contamination can also be confirmed based on documented descriptions of known radioactive material that was placed in certain specific areas in the past, such as records of disposal in a base landfill. Contamination can be on active military installations or base realignment and closure (BRAC) sites that are planned for transfer to the public and redeveloped by local governments or others after remediation using the CERCLA process.

The NRC's jurisdiction applies to radium-226 contamination that has been confirmed. Sites where contamination is only suspected, based on historical activities conducted on a military base, should be tracked and appropriately controlled by the military. If suspected contamination is later confirmed, then this contamination is subject to NRC jurisdiction.

With respect to firing ranges, the NRC has jurisdiction over confirmed radium contamination on closed firing ranges. If DoD is using the CERCLA process for remediation, then the NRC would exercise its jurisdiction and be involved in the remediation process pursuant to the terms of the MOU. The radium contamination on operational firing ranges is not subject to the NRC regulation because this radium is used in traditional military operations on these firing ranges (e.g., the use of targets that contain radium). This clarification is consistent with the SOC in the NARM Rule, which explains that the EPA Act excludes from NRC's jurisdiction military use of radium in "...training for battlefield missions" (72 FR 55901). Further, the risk for exposure at these active firing ranges is low because of the DoD range controls that limit access due to range activities and unexploded ordnance. The NRC conducted independent dose estimates for targets on firing ranges. The results for typical radium items on targets (approximately in the range of ~0.01 to 10 millirem) are consistent with the DoD's comment that the dose consequence will be low if there were an exposure. These results are well below NRC's public dose limit in 10 CFR 20.1301, of 100 millirem per year.

Specifically, NRC staff calculated doses to both workers and members of the public using calculations provided in the International Atomic Energy Agency Code of Conduct on the Safety and Security of Radioactive Sources (Jan. 2004). These calculations, discussed further in ADAMS at Accession No. ML16111B303, assumed a range of typical radium items on targets and that DoD controls would fail and allow access to the firing range.

- Items and equipment not currently used in traditional military operations and no longer intended for future use in traditional military operations

Examples of these items and equipment include vehicles, aircraft, or other equipment in storage that the military is no longer using and that is not intended to be used in the future and could be decontaminated by removing radium-226 instruments, dials, or components in preparation for release of the equipment or vehicles to the public. These items could also include dials or gauges that the military decides are no longer intended for future use in traditional military operations. These items fall under NRC jurisdiction. DoD informed the NRC that the Air Force and Navy currently regulate radium items and equipment in storage or used for calibration or research and development under the Air Force and Navy MMLs. The Army found that most of its items were already disposed of, and those remaining are scheduled for disposal. The Army controls the number of museum items to remain below the 100 items limit allowed under the NRC general license for museums. The NRC will request that DoD confirm in a letter to the NRC that all radium items and equipment are regulated under an appropriate NRC license, i.e., MML or specific license.

## 2) Acceptable Regulatory Approaches and Implementation of the NRC's Jurisdiction: MOU for Remediation of Contamination

For confirmed byproduct, source, or special nuclear material contamination for which DoD is taking CERCLA response actions, the Commission approved the use of an MOU approach instead of licensing. The Commission also directed the staff to periodically evaluate the effectiveness of the MOU. The final MOU is available in ADAMS at Accession No. ML16092A294.

The purpose of the MOU is to minimize dual CERCLA and AEA regulation at DoD environmental remediation sites while ensuring protection of public health, safety, and the environment. The MOU documents the NRC and DoD's roles, responsibilities, and relationship concerning DoD's remediation of AEA material under the CERCLA process. The specifics of an implementation plan for NRC's involvement at DoD sites are given in the MOU provisions but will be jointly refined based on future experience, if necessary.

The two levels of NRC involvement under the MOU are "stay informed" and "monitoring." These approaches do not involve licensing and, accordingly, the staff does not conduct licensing reviews. Under a stay-informed approach, for sites where the U.S. Environmental Protection Agency (EPA) has regulatory authority (e.g., sites listed on the NPL), the staff stays informed of the radiological aspects of remediation activities but will rely on the CERCLA process and EPA's regulatory oversight. Under a monitoring approach, the NRC will monitor sites where the EPA has no regulatory authority or oversight (e.g., sites not listed on the NPL) but DoD is remediating the site under the Defense Environmental Restoration Program, 10 U.S.C. 2700 et

seq., as amended (DERP), which uses the CERCLA remediation process. Further details about NRC's "stay informed" and "monitoring" approaches are provided within the MOU.

As part of NRC's activities under an MOU, the NRC will inquire about the appropriate Agreement or non-Agreement State's involvement with DoD's radiological remediation. On a case-by-case basis, the NRC may consider the results of ongoing State reviews that support the CERCLA remediation process. Agreement States do not have authority to regulate AEA material possessed by Federal entities under their Section 274 agreements. However, Agreement States can assist and provide input as part of the CERCLA remediation process.

#### Benefits resulting from the RIS and MOU Approach

The following are considered by the NRC staff to be benefits from the work that has gone into this RIS and the MOU. These are described in greater detail in Enclosure 7 of SECY-14-0082.

- Avoids confusion by clarifying which radium in military possession is subject to NRC jurisdiction.
- Avoids dual regulation from the overlap of the AEA and CERCLA for DoD remediation of AEA radioactive material subject to the NRC's jurisdiction.
- Clarifies the regulatory approach for unlicensed AEA material, including radium-226, subject to NRC jurisdiction.
- Avoids the potential for reopening of completed military remediation and associated impacts on redevelopment if NRC comments are appropriately addressed.
- Provides independent Federal oversight to ensure protection of public health and safety.

#### **BACKFITTING AND ISSUE FINALITY DISCUSSION**

This RIS requires no action or written response. Any action that licensees take to implement changes or procedures in accordance with the information contained in this RIS ensures compliance with current regulations, is strictly voluntary, and, therefore, is not a backfit under any of the backfitting provisions contained in 10 CFR 50.109, 70.76, 72.62, 76.76, or the issue finality provision of 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." Consequently, the staff did not perform a backfit analysis.

#### **FEDERAL REGISTER NOTIFICATION**

A notice of opportunity for public comment on this RIS was published in the *Federal Register* (76 FR 40282) on July 8, 2011. Comments were received from States, other Federal agencies, and members of the public. The staff considered all comments received. The staff's evaluation of the comments is publicly available through Enclosure 1 of this RIS and through the NRC's ADAMS under Accession No. ML15167A324.

## **CONGRESSIONAL REVIEW ACT**

The NRC has determined this RIS is a rule as designated by the Congressional Review Act (5 U.S.C. §§ 801-808). However, the Office of Management and Budget (OMB) has determined this RIS is not a major rule as designated by the Congressional Review Act.

## **PAPERWORK REDUCTION ACT STATEMENT**

This RIS does not contain any information collection requirements, and, therefore, is not subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.).

## **CONTACT**

This regulatory issue summary requires no specific action nor any written response. If you have any questions about this summary, please contact the technical contact listed below or the appropriate regional office.

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Enclosure:

1. NRC Response to Public Comments

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- Enclosure:  
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**ADAMS Accession No.: ML15167A323 Package: ML15167A324** \*via email

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