

**ORAL ARGUMENT SCHEDULED FOR OCTOBER 9, 2012**

**DOCKET No. 11-1449**

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**UNITED STATES COURT OF APPEALS**  
**FOR THE DISTRICT OF COLUMBIA CIRCUIT**

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**SHIELDALLOY METALLURGICAL CORPORATION**

*Petitioner,*

**v.**

**UNITED STATES NUCLEAR REGULATORY COMMISSION AND**  
**THE UNITED STATES OF AMERICA,**

*Respondents.*

=====

ON PETITION FOR REVIEW OF A FINAL ORDER BY  
THE UNITED STATES NUCLEAR REGULATORY COMMISSION

=====

**FINAL BRIEF OF PETITIONER SHIELDALLOY**  
**METALLURGICAL CORPORATION**

=====

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**CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES**

In accordance with Circuit Rule 28(a)(1), Petitioner Shieldalloy Metallurgical Corporation (“Shieldalloy”) certifies as follows:

- A. **Parties and Amici:** In addition to Petitioner, parties to this action are Respondents U.S. Nuclear Regulatory Commission (“NRC” or “Commission”) and the United States of America. The State of New Jersey (“New Jersey”) has been granted leave to intervene.
- B. **Rulings Under Review:** The agency action under review is the NRC decision reinstating the transfer of authority over Shieldalloy’s facility in Newfield, New Jersey (the “Facility”) to New Jersey, as set forth in its Memorandum and Order, R57 (CLI-11-12, 74 NRC \_\_\_, slip op. (Oct. 12, 2011)) (“CLI-11-12”), JA1.<sup>1</sup> The NRC had previously transferred jurisdiction over the Facility to New Jersey pursuant to an agreement under Section 274 of the Atomic Energy Act, 42 U.S.C. § 2021, between the NRC and New Jersey (the “Agreement”). This Court, in *Shieldalloy Metallurgical Corp. v. NRC*, 624 F.3d 489 (D.C. Cir. 2010)

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<sup>1</sup> In this Brief, the notation “JAxx” refers to the applicable pages in the Joint Appendix, to be provided after briefing is completed. “RXX” denotes the number of the document identified as number XX in the Certified Index of the Record.

(“*Shieldalloy*”), vacated the transfer and remanded the matter to the NRC for further proceedings.

C. **Related Cases:** This matter was previously before this Court and the prior proceedings are discussed in *Shieldalloy*. Counsel is not aware of any related cases in this Court or any other court involving the validity of the transfer of regulatory authority over the Facility from the NRC to New Jersey. Several actions have been instituted but are stayed, pending the outcome of this case, relating to New Jersey's exercise of authority over the Facility after the Agreement went into effect in 2009:

*Shieldalloy Metallurgical Corp. v. State of N.J., et al.*, No. 10-4319 (3d Cir. filed Nov. 24, 2010); *In re N.J.A.C. 7:28*, No. A-278-09 (N.J. Sup. Ct. App. Div. filed Sep. 14, 2009); *Shieldalloy Metallurgical Corp. v. N.J. Dep’t. of Env’tl. Prot.*, No. A-1481-09 (N.J. Sup. Ct. App. Div. filed Nov. 25, 2009); *N.J. Dep’t of Env’tl. Prot./Radiation Prot. Program v. Shieldalloy Metallurgical Corp.*, No. EER 12529-2010S (N.J. Office of Admin. Law filed Nov. 15, 2010); *N.J. Dep’t of Env’tl. Prot./Radiation Prot. Program v. Shieldalloy Metallurgical Corp.*, No. EER 12532-2010S (N.J. Office of Admin. Law filed Nov. 15, 2010).

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Dated: July 26, 2012

**SHIELDALLOY METALLURGICAL CORPORATION'S CORPORATE  
DISCLOSURE STATEMENT**

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure and Circuit Rule 26.1, Shieldalloy Metallurgical Corporation by and through its undersigned counsel, hereby certifies that:

Shieldalloy is a Delaware Corporation and is a direct, wholly-owned subsidiary of Metallurg, Inc., a Delaware corporation, and an indirect subsidiary of Metallurg Holdings, Inc., a Delaware Corporation. It is also an indirect subsidiary of Metallurg Delaware Holdings Corporation, a privately-owned holding company, and of AMG Advanced Metallurgical Group N.V., a publicly-owned company.

Shieldalloy is an industrial company that, at its facility in Newfield, New Jersey, manufactured for a number of years metal alloys from ores containing small amounts of uranium and thorium. Shieldalloy has held for many years Source Materials License No. SMB-743 issued by the U.S. Nuclear Regulatory Commission ("NRC") authorizing it to possess the uranium and thorium at its Facility. Such license has been transferred to the State of New Jersey by order of the NRC.

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**GLOSSARY OF TERMS AND ABBREVIATIONS**

AEA	Atomic Energy Act of 1954, as amended
AEC	United States Atomic Energy Commission (the NRC's predecessor)
Agreement	The agreement between the NRC and the State of New Jersey pursuant to Section 274b of the AEA, effective as of September 30, 2009
ALARA	As Low As Reasonably Achievable
APA	Administrative Procedure Act
Commission	United States Nuclear Regulatory Commission
DP	Decommissioning Plan for the Facility
Facility	The industrial facility owned by Shieldalloy Metallurgical Corporation located in Newfield, New Jersey
LTR	License Termination Rule, Subpart E to 10 C.F.R. Part 20 (10 C.F.R. §§ 20.1401-06)
Materials	Radioactive slag and baghouse dust currently at the Facility

mrem	Millirem
New Jersey's Program	<i>See</i> Program
NJDEP	New Jersey Department of Environmental Protection
NRC	United States Nuclear Regulatory Commission
Program	New Jersey's Radiation Protection Program
RAI	Request for Additional Information issued by the NRC Staff
Shieldalloy	Shieldalloy Metallurgical Corporation
Staff	United States Nuclear Regulatory Commission Staff
TEDE	Total Effective Dose Equivalent

**STATEMENT REGARDING JOINT APPENDIX**

Pursuant to Circuit Rule 30(c), the parties are utilizing the deferred-appendix option described in Rule 30(c) of the Federal Rules of Appellate Procedure.

## **JURISDICTIONAL STATEMENT**

**Basis for Agency's Jurisdiction** – The NRC is authorized by Section 274b of the Atomic Energy Act (“AEA”), 42 U.S.C. § 2021(b) (2006), to enter into agreements that transfer regulatory authority over certain radioactive materials to individual states. The NRC is to enter into such an agreement with a state if the NRC “finds that the State program is . . . compatible with the Commission’s program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.” *Id.* § 2021(d)(2). The AEA defines the categories of materials for which the NRC may transfer regulatory authority as including, *inter alia*, “source materials,” such as those that are involved in the instant Petition. *Id.* § 2021(b)(2). The NRC exercised its powers under Section 274b of the AEA to enter into an agreement with New Jersey pursuant to which it transferred regulatory authority over such materials within New Jersey, including those at the Facility, to that State. Following this Court’s remand in *Shieldalloy*, the NRC again exercised its powers under Section 274b to reinstate the transfer of authority over Shieldalloy’s Facility to New Jersey.

**Basis for Court's Jurisdiction** – The Court has jurisdiction over this matter pursuant to 28 U.S.C. § 2342(4) (2006), 42 U.S.C. § 2239(a) (2006), and 28 U.S.C.

§ 2344 (2006). The Administrative Orders Review Act, also known as the Hobbs Act, gives federal courts of appeals “exclusive jurisdiction to enjoin, set aside, suspend (in whole or in part), or to determine the validity of...all final orders of the Atomic Energy Commission [now the NRC] made reviewable by section 2239 of title 42.” 28 U.S.C. § 2342(4). The AEA provision cited in the Hobbs Act applies to any proceeding “for the granting, suspending, revoking, or amending of any license...[and] for the issuance or modification of rules and regulations dealing with the activities of licensees... .” 42 U.S.C. § 2239(a)(1)(A). The Hobbs Act subjects to judicial review “any final order entered in any NRC proceeding of the kind specified in subsection (a) [of 42 U.S.C. § 2239].” *N.J. v. NRC*, 526 F.3d 98, 102 (3d Cir. 2008) (quotation omitted).

Upon the entry of a “final order” by the NRC reviewable under the Hobbs Act, the agency is required to give prompt notice thereof by service or publication in accordance with its rules. Any party aggrieved by the final order may, within 60 days after its entry, file a petition to review the order in the court of appeals wherein venue lies. 28 U.S.C. § 2344. The proper venue for seeking judicial review of a final NRC action relating to NRC licenses is “in the judicial circuit in which the petitioner resides or has its principal office, or in the United States Court of Appeals for the District of Columbia Circuit.” *Id.* § 2343.

The NRC decision to reinstate the transfer of regulatory authority over the Facility to New Jersey was a “final order” by the NRC affecting a Commission license because regulatory authority over the possession and use of nuclear materials held at the Facility under an NRC license was transferred to New Jersey as of the date of its issuance. CLI-11-12 at 50, JA50.

**Timeliness of Petition for Review** – The transfer of NRC authority was effective as of the issuance of CLI-11-12, October 12, 2011. This Petition for Review was filed on November 22, 2011, within the sixty-day period established by the Hobbs Act. *See* 28 U.S.C. § 2344.

**Finality of Agency Action** – The NRC’s reinstatement of its transfer to New Jersey of regulatory authority over the Facility is a final agency action with respect to the license for that site.

## **STATEMENT OF THE ISSUES PRESENTED FOR REVIEW**

Before the NRC may transfer regulatory authority over licensed facilities to a state, the applying state must have developed a program for the control of radiation hazards that is compatible with the Commission's program for the regulation of the materials over which the state seeks to assume authority. 42 U.S.C. § 2021(d)(2). The state program must also be adequate to protect public health and safety. *Id.* The following issues arise from these requirements, as they apply to the NRC's reinstatement of the transfer of regulatory authority over the Facility to New Jersey:

1. Whether the NRC may withhold, at a licensee's request, transfer of authority over particular categories of materials to a state.
2. Whether the NRC erred in reinstating the transfer of authority over the Facility to New Jersey, since application of New Jersey's program for the control of radiation hazards ("New Jersey's Program" or "the Program") would disrupt the processing of Shieldalloy's proposed decommissioning plan for the Facility.
3. Whether the NRC erred in reinstating the transfer of authority to New Jersey despite the failure of New Jersey's Program to implement the provisions of the NRC's regulations in Subpart E of

10 C.F.R. Part 20, which require compliance with the “as low as reasonably achievable” principle.

4. Whether the NRC erred in reinstating the transfer of authority over the Facility to New Jersey despite the failure of New Jersey’s Program to allow the termination of radioactive materials licenses under restricted release criteria.
5. Whether the NRC erred in reinstating the transfer of authority to New Jersey despite the failure of New Jersey’s Program to implement numerous requirements of the NRC regulations in the area of license termination.
6. Whether the NRC erred in reinstating the transfer of authority to New Jersey despite the failure of New Jersey’s Program to incorporate practices for assuring the fair and impartial administration of regulatory law.
7. Whether, in light of these errors, the NRC’s reinstatement of the transfer of authority over the Facility to New Jersey was arbitrary and capricious and contrary to applicable law.

### **STATEMENT OF THE CASE**

This Petition arises from the NRC's decision to reinstate its transfer of regulatory authority over the Facility to New Jersey. The NRC's original transfer was vacated by this Court in *Shieldalloy*.

The NRC reinstated the transfer even though New Jersey's Program is not compatible with the NRC's program for the regulation of the materials over which the State seeks to assume authority. *See* 42 U.S.C. § 2021(d)(2). The transfer also aborts a twenty-year process to effect the safe decommissioning of the Facility in accordance with NRC regulatory requirements and negates the considerable efforts by Shieldalloy to implement such decommissioning. In reinstating the transfer, the NRC rejected Shieldalloy's plea that the agency had, and should exercise, the power to retain jurisdiction over the materials present at the Facility.

The NRC's departure from its own standards and from the requirements of the AEA renders the reinstatement of the transfer of regulatory authority arbitrary and capricious and warrants that the NRC be directed to resume regulatory authority over the Facility.

## **STATEMENT OF FACTS**

### **A. FACTS LEADING TO *SHIELDALLOY* DECISION**

The essential facts of this case are not in dispute; many of these facts are set forth in the Court's decision in *Shieldalloy*, as described below. Between 1955 and 1998, Shieldalloy manufactured metal alloys at its Facility. Shieldalloy's manufacturing process generated slightly radioactive byproducts in the form of slag and baghouse dust ("the Materials"). Shieldalloy held the Materials on-site under a source materials license from the NRC. *See Shieldalloy*, 624 F.3d at 491.

In the early 1990s, Shieldalloy took the first steps toward decommissioning the Facility. Based on discussions with the NRC staff ("Staff"), it developed a conceptual plan for on-site disposal of the Materials under conditions restricting the site's use. For its part, the NRC began developing, and in 1997 published, a final rule on the decommissioning of licensed facilities. License Termination Rule ("LTR"), Subpart E to 10 C.F.R. Part 20, 10 C.F.R. §§ 20.1401-06; R4 (62 Fed. Reg. 39,058 (July 21, 1997)), JA66. The LTR allows licensees the option of disposing of radioactive materials on-site under restrictions designed to guarantee public health and safety. *See Shieldalloy*, 624 F.3d at 491.

Over the next decade, the Staff and Shieldalloy engaged in extensive discussions regarding the on-site disposal of the Materials. Between 2002 and

2009, Shieldalloy submitted four revisions of its decommissioning plan (“DP”). The first two were rejected by the Staff; the third was accepted for review. The Staff declined to review the fourth revision of the DP, submitted in August 2009. Shieldalloy prepared or revised each proposed revision based on the Staff’s comments on the previous version, an extensive site-specific “Interim Guidance” document provided by the Staff to Shieldalloy on April 15, 2004, and a generic three-volume regulatory guidance document issued by the NRC in 2006.<sup>2</sup> See *Shieldalloy*, 624 F.3d at 491.

From the start, New Jersey strongly opposed the decommissioning approach proposed by Shieldalloy. Thus, when the Staff accepted the third version of the DP for review and an adjudicatory proceeding was initiated before an NRC Atomic Safety and Licensing Board, New Jersey intervened in the proceeding, opposing approval of the DP, and raised numerous “contentions challenging the DP with respect to the technical analyses performed by the Licensee, essentially arguing that the DP has not demonstrated compliance with the relevant statutory and regulatory standards, including those prescribed in 10 C.F.R. § 20.1403” as well as “numerous contentions addressing the legality of the regulatory avenues relied on in the submission of the Licensee’s DP. Specifically, it question[ed] the

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<sup>2</sup> R9 (NUREG-1757, Consolidated Decommissioning Guidance (Sept. 2006)), JA162.

role of the License Termination Rule's restricted use provisions, the use of the Long Term Control-Possession Only License, and the Commission's decommissioning regulations generally." *Shieldalloy Metallurgical Corporation* (Licensing Amendment Request for Decommissioning of the Newfield, New Jersey Facility), Memorandum and Order (Ruling on Hearing Requests), LBP-07-05, 65 NRC 341, 353-54 (2007), JA360-61 (footnotes omitted).

In October 2008, New Jersey requested that the NRC transfer to the State regulatory authority over certain in-state nuclear materials, pursuant to the "Agreement State" provision in the AEA. Under that provision, Congress has authorized the NRC to "enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the [NRC]" and the assumption of authority by the state. 42 U.S.C. § 2021(b). As a precondition to making such an agreement, however, the NRC must find that the state's regulatory regime is "compatible with the [NRC's] program" and that the state's regime is "adequate to protect the public health and safety." *Id.* § 2021(d)(2); *Shieldalloy*, 624 F.3d at 491.

The NRC has set forth thirty-six Compatibility Criteria, published in a policy statement, that it considers in evaluating the compatibility of the state and

federal regulatory programs.<sup>3</sup> A subsequent NRC policy statement clarified its evaluation process, interpreting the compatibility requirement as mandating that the state program must “not create conflicts, duplications, gaps, or other conditions that would jeopardize an orderly pattern in the regulation of agreement material on a nationwide basis.”<sup>4</sup> To carry out these policy statements each element of the NRC’s program is assigned to one of five categories, A through E. For NRC program elements classified as “Category C,” each element of the state program must “embody the essential objective” of the corresponding NRC program element. The NRC determined that the LTR is a Category C program element. *Shieldalloy*, 624 F.3d at 491-92.

The NRC evaluated New Jersey’s Program against the Compatibility Criteria and, after finding it adequate and compatible with the federal program, sought comments from the public on the proposed agreement. In response, *Shieldalloy* submitted comments setting forth a number of reasons why the New

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<sup>3</sup> R1 (Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States through Agreement, 46 Fed. Reg. 7540 (Jan. 23, 1981), as amended by 46 Fed. Reg. 36,969 (July 16, 1981) and 48 Fed. Reg. 33,376 (July 21, 1983)), JA53.

<sup>4</sup> R5 (Statement of Principles and Policy for the Agreement State Program; Policy Statement on Adequacy and Compatibility of Agreement State Programs, 62 Fed. Reg. 46,517, 46,524 (Sept. 3, 1997)), JA108.

Jersey and federal programs were incompatible.<sup>5</sup> One of these reasons was that New Jersey's Program fails to satisfy Compatibility Criterion 25,<sup>6</sup> which requires that appropriate arrangements be made by the NRC and the applying state to "ensure that there will be no interference with or interruption of ... the processing of license applications, by reason of the transfer."<sup>7</sup> Shieldalloy also argued that the NRC had the authority to retain jurisdiction over the Facility even if it decided to transfer jurisdiction over other facilities in New Jersey to the State, and requested that the agency exercise this authority given that a transfer of jurisdiction to New Jersey would be inconsistent with Criterion 25.<sup>8</sup>

The Staff did not address some of Shieldalloy's comments and rejected the rest, including the request that the agency retain jurisdiction over the Facility even if it decided to allow New Jersey to become an Agreement State.<sup>9</sup> Based on the Staff's recommendations, the Commission approved the transfer of authority to

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<sup>5</sup> R42 (Comment Letter from Hoy E. Frakes, Jr., President, Shieldalloy (June 11, 2009)), JA461.

<sup>6</sup> *Id.* at 9-10, JA469-70.

<sup>7</sup> 46 Fed. Reg. at 7,543, JA56.

<sup>8</sup> R42 at 11-12, JA471-72.

<sup>9</sup> R48 (SECY-09-0114, Memorandum from R.W. Borchardt to NRC Commissioners RE: Section 274b Agreement with the State of New Jersey (Aug. 18, 2009)), Encl. 2, JA655.

New Jersey, effective on September 30, 2009.<sup>10</sup> Upon approval of the transfer, the Staff forwarded the fourth revision of the DP to New Jersey, which the Staff had failed to review due to the pendency of the transfer of regulatory authority to New Jersey. *See Shieldalloy*, 624 F.3d at 491.

Only a few days after the transfer of authority, New Jersey notified Shieldalloy that the fourth revision of the DP did not meet New Jersey's regulatory requirements and directed Shieldalloy to submit a new plan that satisfied those requirements.<sup>11</sup> New Jersey thus summarily terminated processing of Shieldalloy's license application and did not even address the previously ongoing Staff reviews of the DP.<sup>12</sup>

The Court's opinion in *Shieldalloy* describes what happened next: "Worried that it would now be forced to jettison its plans for on-site remediation and instead

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<sup>10</sup> R50 (State of New Jersey: Discontinuance of Certain Commission Regulatory Authority Within the State; Notice of Agreement Between the Nuclear Regulatory Commission and the State of New Jersey, 74 Fed. Reg. 51,882 (Oct. 8, 2009)), JA669.

<sup>11</sup> *See Shieldalloy*, 624 F.3d at 492.

<sup>12</sup> New Jersey had announced at least as early as December 2008 that, once it assumed jurisdiction over the Facility, it would reject the decommissioning approach proposed by Shieldalloy. R42, Encl. at 175, JA648. Immediately upon assuming regulatory authority over the Facility, it proceeded to do so. The NRC was well aware of New Jersey's intentions long in advance of the transfer of regulatory authority to New Jersey. *See, e.g.*, R47 (Agenda and Talking Points for 8/13/09 and 8/17/09 Briefings Re: Final Staff Recommendations for NJ Agreement Application), JA651.

transfer the radioactive materials to a facility in Clive, Utah, Shieldalloy sought relief along multiple avenues. It requested an exemption from the relevant New Jersey regulatory provisions (and was denied). It filed a motion with the NRC to stay the transfer for regulatory authority (and was denied). And it filed the instant petition [in the D.C. Circuit] challenging the NRC's transfer." *Shieldalloy*, 624 F.3d at 492. Upon review, the Court issued a unanimous opinion that found the NRC decision to transfer jurisdiction over the Facility to New Jersey to be arbitrary and capricious, vacated the transfer, and remanded the matter to the NRC for further proceedings. *Id.* at 495 & 497.

## **B. POST-REMAND PROCEEDINGS**

Following the remand, the NRC "invited Shieldalloy, as well as New Jersey, to submit any views on whether we should reinstate the transfer of regulatory authority to New Jersey or retain regulatory authority over the Shieldalloy site." CLI-11-12 at 7, JA7. Shieldalloy and New Jersey each filed initial and reply responses to the NRC's invitation. *Id.* Eight months after receiving the last of these responses (*see id.* at 7 n.16, JA7), the NRC issued its decision, in which it reinstated its transfer of authority to New Jersey. The agency's decision failed to give due account to Shieldalloy's positions, as presented in prior proceedings and in the most recent submittals.

### **SUMMARY OF THE ARGUMENT**

A government agency must articulate a satisfactory explanation for its actions if they are to survive review under the “arbitrary or capricious” standard.

An agency must also adequately address legitimate objections and explain departures from its precedent. An agency’s failure to respond meaningfully to objections renders its decision arbitrary and capricious.

The NRC failed to provide a satisfactory explanation for transferring regulatory authority over the Facility to New Jersey despite the incompatibility of New Jersey’s Program with NRC regulations in the area of facility license termination. The agency also failed to respond meaningfully to Shieldalloy’s objections to the license termination elements of New Jersey’s Program. For these reasons, the NRC’s reinstatement of the transfer of authority over the Facility to New Jersey was arbitrary and capricious and should be set aside.

In particular, Compatibility Criterion 25 provides that the NRC and the applying state should “ensure that there will be no interference with or interruption of licensed activities or the processing of license applications, by reason of the transfer.” 46 Fed. Reg. at 7,543, JA56. The NRC’s reinstatement of the transfer of regulatory authority over the Facility to New Jersey failed to satisfy this Criterion.

Despite the NRC's long history of working with Shieldalloy to implement a decommissioning plan based on stabilization of the Materials and on-site disposal, the NRC reinstated the transfer of authority in full knowledge that New Jersey would derail the ongoing licensing process. The NRC also rejected Shieldalloy's request that the agency exclude the class of materials present at the Facility from the transfer of authority to New Jersey, even though the NRC has the power to do so and should have exercised it under the circumstances of this case.

In order for a state program for the control of radiation hazards to be compatible with the NRC's, the state's program elements for which the counterpart NRC regulations are classified as Compatibility Category C must "embody the essential objective" of the corresponding NRC program elements. In the area of facility decommissioning, the essential objective of the LTR is "to ensure that decommissioning will be carried out without undue impact on public health and safety and the environment." 62 Fed. Reg. at 39,058, JA66.

A critical aspect of the LTR is a principle that is central to the NRC's radiation protection regulations: decommissioning must be conducted such that the radiation doses resulting from the decommissioning process are as low as reasonably achievable ("ALARA"). To "embody the essential objective" of the LTR, a state's radiation protection program needs to incorporate the ALARA

principle into its license termination regulations. New Jersey's Program, however, fails to incorporate the ALARA principle into its license termination regulations, and in so doing forecloses the decommissioning option for the Facility that would result in the lowest radiation exposures. New Jersey's Program, therefore, is inconsistent with the NRC's regulatory regime in the area of license termination.

Another important aspect of the LTR is that it addresses the few licensed sites containing large quantities of materials contaminated with low-level radioactivity where public health and the environment may be best protected by on-site stabilization and disposal. To permit the safe decommissioning of those sites, the LTR includes the option of terminating a license by allowing radioactive materials to remain at the site upon the implementation of approved stabilization methods, subject to government supervision and other controls. The NRC specifically identified the Facility as a site for which the on-site disposal option is beneficial, and it worked with Shieldalloy for twenty years towards the implementation of that option.

The NRC reinstated the transfer of regulatory authority over the Facility with full knowledge that New Jersey's Program precludes license termination based on on-site disposal of radioactive materials. The NRC erred in finding New

Jersey's Program compatible with its regulations when the Program fails to achieve the LTR's "essential objective" – minimizing public exposure to radiation.

There are other respects in which the decommissioning provisions of New Jersey's Program significantly deviate from those in the LTR. In promulgating the LTR, the NRC had given due consideration to, and rejected, positions identical to those contained in New Jersey's Program. There is no rational basis for the NRC's conclusion that the Program is "compatible" with the NRC's when the agency had explicitly rejected those positions in its own rulemaking.

Compatibility Criterion 23 requires that state practices for assuring the fair and impartial administration of regulatory law should be incorporated into the state's rules of general applicability. In contravention of this Criterion, New Jersey's regulations on license termination are unfairly and uniquely aimed at the Facility.

Each of the instances of incompatibility between New Jersey's Program and the NRC regulations suffices to invalidate the NRC's reinstatement of the transfer of regulatory authority over the Facility. In addition, examining the totality of the NRC actions in disregard of its own regulations and Compatibility Criteria, as well as the requirements of the AEA, compels the conclusion that the NRC has acted in an arbitrary and capricious manner.

### **STANDING**

Shieldalloy held NRC Source Materials License No. SMB-743 for its Facility in Newfield, New Jersey. Effective September 30, 2009, the NRC transferred to New Jersey the regulatory authority over the possession and use of certain categories of materials held under licenses granted by the NRC. R50 (74 Fed. Reg. 51,882 (Oct. 8, 2009)), JA669. Shieldalloy's NRC license for the Facility was one of those for which regulatory authority was transferred to New Jersey. R48 (SECY-09-0114) at 3-4, JA659-60. On October 12, 2011, the NRC reinstated its transfer of regulatory authority over the Facility to New Jersey. CLI-11-12, JA1.

This latest NRC action has had a direct and detrimental impact on Shieldalloy. In this Petition, Shieldalloy is asking the Court to provide redress by again reversing the transfer to New Jersey of regulatory authority over the Facility.

This Court has noted: "In many if not most cases the petitioner's standing to seek review of administrative action is self-evident; no evidence outside the administrative record is necessary for the court to be sure of it. In particular, if the complainant is 'an object of the action (or forgone action) at issue' - as is the case usually in review of a rulemaking and nearly always in review of an adjudication - there should be 'little question that the action or inaction has caused him injury,

and that a judgment preventing or requiring the action will redress it.”” *Sierra Club v. EPA*, 292 F.3d 895, 899-900 (D.C. Cir. 2002) (citing *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 561-62 (1992)). Here, based on the above facts, it is “self-evident” that Shieldalloy has standing to challenge the NRC’s action.

## ARGUMENT

### **I. STANDARD OF REVIEW**

The Administrative Procedure Act (“APA”) requires a court to “hold unlawful and set aside agency action” if it is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A) (2006). The standard of review applicable to this Petition was summarized by the Court in *Shieldalloy* as follows:

In reviewing agency action that is alleged to be arbitrary or capricious, we are “not to substitute [our] judgment for that of the agency,” but we must ensure that the agency has “examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a ‘rational connection between the facts found and the choice made.’” *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962)). Encompassed in the latter duty, of course, is the obligation of an agency to explain any important changes of policy or legal interpretation. *Ramaprakash v. FAA*, 346 F.3d 1121, 1124 (D.C.Cir.2003). And agencies must evaluate parties' proposals of “significant and viable” alternatives. *Farmers Union Cent. Exch., Inc. v. FERC*, 734 F.2d 1486, 1511 n.54 (D.C.Cir.1984).

*Shieldalloy*, 624 F.3d at 492-93 (alterations in original).

Also, “an agency’s failure to respond meaningfully to objections raised by a party renders its decision arbitrary and capricious. We have stressed that unless the agency answers objections that on their face seem legitimate, its decision can

hardly be classified as reasoned.” *PPL Wallingford Energy LLC v. FERC*, 419 F.3d 1194, 1198 (D.C. Cir. 2005) (quotations and citations omitted).

## **II. THE NRC HAS THE POWER TO WITHHOLD TRANSFER OF AUTHORITY OVER PARTICULAR CATEGORIES OF MATERIALS AT THE REQUEST OF A LICENSEE**

In its earlier challenge to the NRC’s transfer of authority over the Facility to New Jersey, Shieldalloy argued that the NRC had the authority to retain jurisdiction over the Facility even if it approved New Jersey’s Agreement State application, and should do so consistent with Compatibility Criterion 25 and notions of fundamental fairness and efficiency. The NRC responded to Shieldalloy’s argument by alleging: (1) that its retaining jurisdiction over the Facility (as requested by Shieldalloy) would result in concurrent NRC and state jurisdiction over the same type of nuclear materials, contrary to the legislative intent of Section 274 of the AEA; (2) that implementation of this approach (retaining authority over a single facility) may be inconsistent with the Commission’s authority under the AEA; and (3) (at oral argument) that the AEA did not permit a partial transfer of regulatory authority other than at the request of the would-be transferee state. *See Shieldalloy*, 624 F.3d at 493-95. The Court rejected most of these arguments “as inapposite and woefully incomplete” (*id.* at 493) and, with respect to the new allegation at oral argument that the AEA allows partial transfers of authority only if requested by the applying state, it concluded

that it could not “defer to the interpretive proposals offered by NRC counsel at oral argument. As the sections of the statute to which our attention has been drawn do not plainly compel the reading now proposed, we cannot affirm on the basis of that reading.” *Id.* at 495.

In *Shieldalloy*, the Court read Section 274b to “suggest[] that the NRC is not *required* to enter into agreements” and to indicate that the Commission “has discretion to negotiate the terms of the agreement with the state requesting authority.” *Shieldalloy*, 624 F.3d at 495 (emphasis in original). On remand, the NRC chose to interpret the Court’s ruling in *Shieldalloy* as leaving the agency “entirely free, unrestrained by any judicial holding, to decide for ourselves what section 274 [of the AEA] requires.” CLI-11-12 at 11, JA11. It then proceeded to interpret Section 274b of the AEA as merely giving the NRC “a general grant of legal authority...to turn regulatory authority over certain designated nuclear materials to the states.” *Id.* at 12, JA12. The legislative history of the provision makes clear, however, that Congress intended the NRC to have flexibility to determine how its agreement with a state should be framed. *See* H.R. Rep. No. 86-1125 at 10 (1959), *reprinted in* 1959 U.S.C.C.A.N. 2872, 2880 (“Subsection b. *permits* the Commission to discontinue its authority [over designated categories of material] and encourages States, when qualified, to assume the responsibility.”) (emphasis added); 105 Cong. Rec. 19043 (daily ed. Sept. 11, 1959) (statement of

Sen. Anderson) (“[t]he bill *authorizes* the Commission to enter into agreements with State Governors providing for discontinuance of certain of the Commission’s regulatory authority, after proper certification by the Governor and findings by the Commission that the State program is adequate.”) (emphasis added).

The NRC’s gloss on another provision, Section 274d of the AEA, would have the agency strait-jacketed into accepting without modifications a requested transfer of authority to a state if specified conditions are met. *See* CLI-11-12 at 16-17, JA16-17. However, the legislative history of Section 274 suggests that Congress intended for the Commission to retain flexibility as it entered into agreements with states.

On May 13, 1959, the Atomic Energy Commission (“AEC”) (the NRC’s predecessor) submitted a proposed bill to the Joint Committee on Atomic Energy in response to a request by Senator Clinton Anderson. Section d of the AEC’s proposed bill closely corresponds to the ultimate AEA Section 274d language. The AEC explained its intended responsibilities under the proposed bill in permissive, rather than mandatory, terms: “Essentially, the objectives of this proposed bill...are to provide procedures and criteria whereby the Commission *may* turn over to individual States, as they become ready, certain defined areas of regulatory jurisdiction.” Letter to Hon. Clinton P. Anderson, Chairman, Joint Committee on

Atomic Energy, from A. R. Luedecke, General Manager, Atomic Energy Commission, May 13, 1959, *Federal-State Relationships in the Atomic Energy Field: Hearings Before the Joint Committee on Atomic Energy*, 86<sup>th</sup> Cong., 1<sup>st</sup> Sess. at 294 (1959) (“*Joint Committee Hearings*”) (emphasis added); *id.* (“[t]he bill includes criteria which would need to be met before the Commission *could* turn over any of its responsibilities to a State.”) (emphasis added); *id.* at 299 (“Subsection (d) specifies the findings which the Governor of the State and the Commission must make before the Commission *can* enter into an agreement with the State under the bill.”) (emphasis added).

In reporting its amended bill (H.R. 8755) to the House of Representatives, the Joint Committee on Atomic Energy used similar language of discretion:

Subsection d. provides for certification by the Governor, and a finding by the Commission, before any agreement *may* be entered into. It is intended to protect the public health and safety by assuring that the State program is adequate before the Commission *may* withdraw its regulatory responsibilities.

H.R. Rep. No. 86-1125 at 11 (emphasis added). Notably, nowhere in their respective comments did the AEC or the Joint Committee indicate that Section 274d was intended to bind the Commission to make requested transfers of authority, in the precise manner requested by the state, if the specified conditions were met. Rather, this legislative history shows an intent by Congress that the Commission would be permitted to conclude such agreements with states if the

statutory factors are satisfied, but would have flexibility to craft such agreements to include or exclude particular categories of materials.

Other provisions in Section 274 of the AEA provide additional evidence that Congress intended for the NRC to retain flexibility in determining how to fashion and manage its agreement with a state. Section 274c(4), for example, authorizes the Commission to determine that a disposal scheme suggested by a state should not be permitted, by excluding from transfers to a state authority and responsibility with respect to:

the disposal of such other byproduct, source, or special nuclear material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

Section 274c(4) of the AEA, 42 U.S.C. § 2021(c)(4). This “authority reserved by Section 274(c) [is] exclusively for the Commission to exercise.” *Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm’n*, 461 U.S. 190, 209 (1983). In proposing the language of Section 274c(4) in 1959, the AEC explained that this provision “gives the Commission *authority and flexibility* for the continued exercise of Commission regulatory controls for such disposals as the Commission determines require the continued exercise of its controls... .” *Joint Committee Hearings* at 309 (emphasis added). Likewise, the NRC retains the authority to suspend or terminate the transfer of authority to a state if such termination is

necessary to protect public health or safety or if the state has failed to comply with the requirements of Section 274. Section 274j(1) of the AEA, 42 U.S.C. § 2021(j)(1). The Joint Committee viewed this language as a “reserve power” that the Commission could exercise under appropriate circumstances. H.R. Rep. No. 86-1125 at 12.

There is nothing in the legislative history of Section 274 of the AEA to suggest that the statute *requires* the NRC to transfer regulatory authority over particular categories of materials to a state just because the state requests such a transfer.<sup>13</sup> The NRC’s “all or nothing” argument is inconsistent with the flexibility inherent in the Congressional scheme.

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<sup>13</sup> The NRC’s position in this case that it is impotent to control what aspects of its authority it will relinquish to a requesting state is inconsistent with the agency’s frequent assertion in other contexts of its unlimited supremacy over the states in the regulation of the possession and use of nuclear materials. *See, e.g.*, 10 C.F.R. § 8.4(b) (2011) (“The regulatory pattern [set forth by the AEA] requires, in general, that . . . the possession and use of byproduct material (radioisotopes), source material (thorium and uranium ores), and special nuclear material (enriched uranium and plutonium, used as fuel in nuclear reactors), be licensed and regulated by the Commission.”); *see also Pac. Gas & Elec. Co.*, 461 U.S. at 207 (observing that the AEA granted to the Commission “exclusive jurisdiction to license the transfer, delivery, receipt, acquisition, possession and use of nuclear materials”); *Silkwood v. Kerr-McGee Corp.*, 464 U.S. 238, 250 (1984) (noting that enactment of Section 274 of the AEA “still precluded [states] from regulating the safety aspects of these hazardous [byproduct, source or special nuclear] materials”).

The second part of the NRC's argument is that, while the agency has the power to authorize partial transfers of authority over a given category of materials, it can do so only at the behest of a requesting state and not if sought by a licensee. *See* CLI-11-12 at 19-20, JA19-20. The agency, however, implicitly recognizes that it has found nothing in the legislative history or in the statute itself that supports this view. *See id.* at 18, JA18. The NRC speculates that allowing licensees to seek that their facilities remain under the jurisdiction of the NRC would give them an incentive "to manipulate the license application process depending on which regulatory scheme they preferred." *Id.* at 19, JA19. But such speculation bears no connection to reality – an NRC licensee seeking to terminate its license cannot "manipulate" the application process, but must conform to the rigorous requirements of the NRC regulations, as the example of Shieldalloy's arduous efforts to gain NRC approval of its DP demonstrates. Further, the NRC is not obliged to accede to a licensee's request that authority for a facility remain with the agency, thus no "manipulation" by a licensee is possible.

The NRC also argues that Congress "desired states to assume authority either over all of the sites within a particular nuclear materials category or over none of the sites within that category." *Id.* at 18, JA18. The basis offered for this assertion is Congress's intent to "avoid any form of 'concurrent' or piecemeal federal-state jurisdiction over a specified nuclear materials category." *Id.* This

argument is refuted by the very actions the NRC took when it agreed to retain authority over certain facilities in Oklahoma, while transferring authority over others to that State. Moreover, a review of the legislative history on this issue shows that Congress was concerned not by the prospect of a subdivision of the nuclear material categories or facilities under federal and state authority in a given state, but rather by the dual regulation of the same facility by both federal and state authorities. Thus, during hearings by the Joint Committee, Robert Lowenstein of the AEC Office of General Counsel interpreted the term “concurrent jurisdiction” to mean “both the Federal Government and the States having fairly coextensive responsibilities.” *Joint Committee Hearings* at 315. Mr. Lowenstein stated that the primary concerns associated with concurrent jurisdiction were that it would be wasteful of resources, would provide for controls by multiple levels of government without “centralized responsibility,” and would “subject the users of these materials to the burdens of procedural dealing with a great many different agencies on the same questions.” *Id.* at 315-16.

In this context, the Commission’s retention of jurisdiction over designated facilities despite its relinquishment of authority over others in a material category would not present the concurrent jurisdiction problems that Congress attempted to avoid, for licensees would not face uncertainty concerning which agency had authority over their licenses. Thus, so long as the agreement identified the

respective federal or state jurisdiction over a specified category of material, the problem of concurrent jurisdiction would not arise.

The NRC itself came to the conclusion that the problem of potential concurrent jurisdiction could be avoided by defining the circumstances under which retention of jurisdiction over discrete categories of materials would be allowed. The criteria it developed in SECY-97-087 in connection with Oklahoma's request that the NRC retain jurisdiction over certain facilities are:

Overall, the staff would consider whether the proposed Agreement would jeopardize "...an orderly regulatory pattern between the Commission and the State governments..." as indicated by Section 274a(3) of the AEA. In particular, requests for limited Agreements would have to identify discrete categories of material or classes of licensed activity that (1) can be reserved to NRC authority without undue confusion to the regulated community or burden to NRC resources, and (2) can be applied logically, and consistently to existing and future licensees over time. Under this approach, NRC would not reserve authority over a single license unless that licensee clearly constituted a single class of activity or category of material meeting the two criteria described above.

R2 (SECY-97-087) at 3, JA65.

Under these criteria, the NRC could reserve authority over a single license if that "licensee clearly constituted a single class of activity or category of material meeting the two criteria" of being able to reserve authority to the NRC without undue confusion or burden and being applicable logically and consistently to existing and future licensees over time. *Id.* Neither of the two criteria is based on

*who* requests that the NRC retain jurisdiction over a site or a category of sites. All that matters is whether such a class of activity or category of material (1) can be reserved to NRC authority without undue confusion to the regulated community or burden to NRC resources, and (2) can be applied logically and consistently to existing and future licensees over time.<sup>14</sup>

Both conditions are met in this case. As New Jersey acknowledges, the Facility is the only one of its type in New Jersey, and no other such facilities are expected to be licensed in the future in that State. R23 (NJ Agreement Application), Section 4.3.1 at 2, JA444. Therefore, jurisdiction over the Facility could be retained by the NRC by excluding the particular subcategories of source material existing at the Facility from the transfer of authority to New Jersey.<sup>15</sup> Retention of jurisdiction over the Materials at the Facility would not result in any concurrent exercise of jurisdiction by the NRC and New Jersey and would satisfy the criteria set forth in SECY-97-087.

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<sup>14</sup> The development of criteria for authorizing partial transfers of authority is a vivid example of the NRC's ability to tailor the terms of its transfer of authority to a requesting state, contrary the NRC's protestations that it is precluded from doing so by the AEA. The NRC does not disagree. CLI-11-12 at 20 n.53, JA20.

<sup>15</sup> Thus, although the NRC at first refused Oklahoma's request to exclude five named facilities, the NRC and Oklahoma eventually entered into an agreement which applied to only a specific subcategory of source material and had the effect of continuing NRC jurisdiction over those facilities while transferring to Oklahoma authority over other source material licenses. *See Shieldalloy*, 624 F.3d at 494.

As the Court found in *Shieldalloy*, such an approach was endorsed by the NRC and applied to exclude certain sites from the transfer of regulatory authority to the State of Oklahoma:

in 1999, Oklahoma proposed a limited agreement that excluded a subcategory of materials—a category that aligned closely with the sites Oklahoma had desired to exclude in its site-specific proposal two years earlier. Applying the previously developed factors for limited agreements, the NRC staff this time recommended approval of the limited transfer. The Oklahoma case is strikingly relevant to *Shieldalloy*'s situation because *Shieldalloy* argues, and the NRC does not dispute, that *its* radioactive wastes constitute the sole New Jersey example of a discrete subcategory of materials.

*Shieldalloy*, 624 F.3d at 494 (emphasis in original). The NRC's refusal to apply this option renders its reinstatement of the transfer of authority over the Facility to New Jersey arbitrary and capricious.

### **III. THE NRC ERRED IN REINSTATING THE TRANSFER OF REGULATORY AUTHORITY BECAUSE NEW JERSEY'S PROGRAM DISRUPTS THE EVALUATION OF SHIELDALLOY'S PROPOSED DECOMMISSIONING PLAN**

In prior proceedings before this Court, *Shieldalloy* argued that the NRC's transfer of authority over the Facility to New Jersey did not satisfy Compatibility Criterion 25 because, at the time of the transfer, there was a pending licensing application under review by the NRC to which Compatibility Criterion 25 applied. Criterion 25 provides as follows:

*Existing NRC Licenses and Pending Applications.* In effecting the discontinuance of jurisdiction, appropriate arrangements will be made by NRC and the State to ensure that there will be no interference with

or interruption of licensed activities or the processing of license applications, by reason of the transfer.

46 Fed. Reg. at 7,543, JA56. Shieldalloy contended that it was arbitrary and capricious for the NRC to transfer authority over the Facility because the transfer would inevitably result in the interruption, indeed the abrupt termination, of the processing of Shieldalloy's license application. Shieldalloy had worked for many years at significant expense to develop a decommissioning plan for the Facility that would be acceptable to the NRC. Multiple revisions of the DP were prepared to address the comments of the Staff, and at the time authority was transferred to New Jersey, the Staff was reviewing that plan. New Jersey had made clear that if it obtained regulatory authority over the Facility it would refuse to even consider the approach set forth in the DP. The NRC was aware of New Jersey's intent to terminate the processing of Shieldalloy's licensing application when it agreed to transfer authority to the State. The NRC's action approving the transfer of regulatory authority over the Facility to New Jersey, therefore, was in direct contradiction of Compatibility Criterion 25.

In *Shieldalloy*, the Court found that the NRC did not adequately respond to Shieldalloy's position:

Other elements of the NRC's response as to criterion 25 were equally dismissive. The NRC staff said that New Jersey's regulatory scheme recognized existing NRC licenses and would continue "any licensing actions that are in progress" at the time of the agreement. NRC Staff

Comments at 8. The NRC thus concluded that there would be a “smooth transition” and that New Jersey would make decisions on pending licensing actions. *Id.*

This hardly answered Shieldalloy's contention that its license termination process would be disrupted and that no appropriate arrangements had been made. Although the fact of New Jersey's participation in prior or concurrent NRC regulatory proceedings does not necessarily prejudice a transfer agreement, the formal existence of New Jersey provision for transfer seems in no way an assurance that the transfer would satisfy criterion 25's intended preclusion of “interference with or interruption of licensed activities or the processing of license applications.” 46 Fed.Reg. at 7543. Obviously the NRC need not automatically consider every single pending licensing action individually when it considers transfer to a state. But in this case the NRC had a long history of dialogue and cooperation regarding the termination of a license, the state has been consistently hostile to those termination proceedings, and the regulated entity alerted the NRC not only to the likely interference with decommissioning but also to partial transfer as a possible solution. At the very least, the NRC should have explained how Shieldalloy's decommissioning process could proceed under the New Jersey regime free of the interference and interruption sought to be avoided by criterion 25 and why the partial transfer was not an appropriate alternative arrangement.

*Shieldalloy*, 624 F.3d at 494-95.

The NRC's response to the Court's finding is to claim that both Shieldalloy and the Court wrongly interpret Criterion 25 as imposing substantive obligations on the NRC with respect to the transfer of pending licensing applications. In CLI-11-12, the NRC declares that Criterion 25 is merely a “housekeeping” criterion, without any substantive effect. CLI-11-12 at 30, JA30. All that Criterion 25 requires, in the NRC's interpretation, is that the NRC ensure that “licensing

records are transferred to and received by the new agreement state in an orderly manner that ensures that no pending licensing actions will be significantly delayed or that no records will be lost or misplaced as a result of the transition of authority.” *Id.*

There are at least two problems with the NRC’s explanation. *First*, it is a revisionist view of the reach of the Criterion. The NRC had multiple opportunities, both while evaluating Shieldalloy’s comments on New Jersey’s application and before this Court, to state that Criterion 25 confers no rights to a license applicant because the Criterion only deals with records transfers. Instead, in each case, the NRC has addressed Criterion 25 in a different light.

For instance, in responding to Shieldalloy’s claim that New Jersey’s Program violates Criterion 25, the NRC stated, at the time it first approved New Jersey’s Agreement State application:

Criterion 25 addresses the transition between NRC and the State to ensure that there will be no interference with or interruption of licensed activities or the processing of license applications by reason of the transfer. The intent of this criterion is to ensure that licensees can continue to operate without interference with or interruption of licensed activities after the effective date of the Agreement.

NRC’s review confirmed that State Statute N.J.S.A. 26:2D-9(k) contains a provision that provides for recognition of existing NRC and Agreement State licenses. NJDEP BER Procedure 3.08, “License Transition from NRC to New Jersey,” addresses the transfer of NRC licenses to the State. Upon completion of the Agreement, all active NRC licenses issued to facilities in NJ will be recognized as NJDEP

licenses. This will ensure a smooth transition in authority from NRC to NJ so that licensees can continue to operate without interference with or interruption of licensed activities. NJ will continue any licensing actions that are in progress at the time of the Agreement and make the final decision on all pending licensing actions.

R48 (SECY 09-0114), Encl. 2 at 8, JA664. Likewise, in rejecting Shieldalloy's motion for a stay pending this Court's consideration of its initial review petition, the NRC stated:

New Jersey law provides for recognition of NRC licenses, and NJDEP procedures provide that upon the effective date of the agreement, all active NRC licenses issued to facilities in New Jersey will be recognized as NJDEP licenses. Consistent with Criterion 25, the NJDEP recognized Shieldalloy's source material license at the Newfield site. Furthermore, in rejecting its proposed decommissioning plan, the NJDEP acknowledged that Shieldalloy met the timeliness requirements of 10 C.F.R. § 40.42 when it submitted the plan to the NRC. It used this as a basis for granting Shieldalloy an extension of time to file a revised decommissioning plan. These actions appear to be consistent with an orderly transfer of authority between the NRC and New Jersey.

*Shieldalloy Metallurgical Corp.* (Newfield, New Jersey Site), CLI-10-08, 71 NRC 142, 162 (2010), JA698 (footnotes omitted). None of the NRC pronouncements previous to CLI-11-12 characterized Criterion 25 as a mere "housekeeping" provision.<sup>16</sup>

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<sup>16</sup> This and other current NRC attempts at providing justifications inconsistent with the agency's prior explanations should be given no weight. It is well established that the agency must have articulated a rational explanation for its action at the time of its decision, not in revisionist positions in after-the-fact

*Second*, the other problem with the NRC's litigation-driven interpretation of Criterion 25 is that there is far more to the Criterion than just record collection and transfer (although that is an aspect of any transfer of authority). The very excerpts quoted above indicate that the NRC seeks to ensure a smooth transition in authority from NRC to the applying state so that licensees can continue to operate without interference with or interruption of licensed activities, that the state will continue any licensing actions in progress at the time of the Agreement and make the final decision on all pending licensing actions, and that gaps or lapses in regulation are to be prevented. Contrary to the NRC's newly minted explanation, Criterion 25 requires far more than collecting licensing records and tossing them over the transom to the applying state. As the very text of the Criterion prescribes, the NRC must "ensure that there will be no interference with or interruption of licensed activities or the processing of license applications, by reason of the transfer." 46 Fed. Reg. at 7,543, JA56. Mere records turnover does not satisfy this requirement.

In CLI-11-12, the NRC insists that Shieldalloy (and the Court) would require the NRC to retain authority over sites for which a license termination application was pending, or compel a state to take a regulatory approach identical to the NRC's with respect to pending applications. CLI-11-12 at 29 & 33-34,

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litigation. *Williams Gas Processing-Gulf Coast Co., L.P. v. FERC*, 475 F.3d 319, 326 (D.C. Cir. 2006).

JA29 & JA33-34. Shieldalloy has never sought to impose such requirements on the NRC. What Shieldalloy has argued, and a fair reading of Criterion 25 compels, is the notion that under the unique circumstances of this case, in which transfer of authority over the Facility to New Jersey would signify the immediate termination of the long-pending licensing proceeding, the NRC, with full knowledge of the situation, had an obligation to consider alternatives to such a transfer, particularly after the relevant factors and potential alternatives were pointed out by Shieldalloy long in advance of the agency's action. The NRC had such an obligation in this case under Criterion 25, and the failure to discharge it was arbitrary and capricious.

The NRC's failure to give due consideration of potential alternatives to the transfer of authority over the Facility to New Jersey was also inconsistent with the requirements of the APA, which commands that federal agencies act with "due regard for the rights and privileges of all the interested parties" when presented with license applications. 5 U.S.C. § 558(c) (2006). The APA includes such a provision to fulfill its design of "promot[ing] general fairness and regularity in administrative action." *Pan-Atl. S.S. Corp. v. Atl. Coastline R.R. Co.*, 353 U.S. 436, 442-43 (1957). The NRC itself acknowledges that, as the APA commands, it has an obligation to treat participants to its licensing proceedings fairly. *See Baltimore Gas & Electric Co. (Calvert Cliffs Nuclear Power Plant, Units 1 and 2)*, CLI-98-25, 48 NRC 325, 343 n.4 (1998). It has not met its obligation here.

#### **IV. THE NRC ERRED IN REINSTATING THE TRANSFER OF AUTHORITY OVER THE FACILITY TO NEW JERSEY DESPITE THE FAILURE OF NEW JERSEY'S PROGRAM TO MEET SEVERAL COMPATIBILITY CRITERIA**

In CLI-11-12, the NRC advances novel arguments in an effort to bolster its previous erroneous determination that New Jersey's Program is compatible with the NRC's. As the discussion below demonstrates, the NRC's arguments in defense of its compatibility determination are unsound and often unprecedented and provide no support for the agency's decision to reinstate its transfer of authority over the Facility to New Jersey.

##### **A. New Jersey's Program fails to implement the provisions of the NRC's regulations at 10 C.F.R. Part 20, Subpart E, which require compliance with the ALARA principle**

The Commission has stated in numerous contexts that the purpose of the ALARA standard is to ensure that there will not be radiological exposures to the public or releases to the environment beyond the minimum amount that cannot be reasonably avoided, regardless of the absolute value of the dose limit set forth in a regulation. ALARA "means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken." 10 C.F.R. § 20.1003 (2011). "The ALARA concept means that all doses are to be reduced below required levels to the lowest reasonably achievable level considering economic and societal factors. Determination of levels that are ALARA must consider any

detriments, such as deaths from transportation accidents, that are expected to potentially result from disposal of radioactive waste.” NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1 (Nov. 2002), at 2-6 n.(a) (available at <http://adamswebsearch.nrc.gov/idmws/ViewDocByAccession.asp?AccessionNumber=ML023500395>).<sup>17</sup>

The unsoundness of the NRC’s new compatibility arguments is evident in its discussion of the ALARA principle. The NRC professes not to understand Shieldalloy’s “diffuse,” “summary,” and “conclusory” ALARA argument. CLI-11-12 at 34-36, JA34-36.<sup>18</sup> The NRC then seeks to refute what it terms

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<sup>17</sup> The ALARA principle is invoked in four provisions relevant to the termination of NRC licenses: 10 C.F.R. §§ (1) 20.1402 (Radiological Criteria for Unrestricted Use); (2) 20.1403 (Criteria for License Termination Under Restricted Conditions); (3) 20.1404 (Alternate Criteria for License Termination); and (4) 20.2002 (Method for Obtaining Approval of Proposed Disposal Procedures). ALARA requirements are also imposed in over a dozen additional NRC regulatory provisions in 10 C.F.R.: (1) § 20.1003; (2) § 20.1101; (3) §20.1206; (4) §20.1301; (5) §10.1601; (6) §20.1702; (7) §20.1704; (8) §20.2105; (9) §20.2203; (10) §34.3; (11) §34.42; (12) Appendix A to Part 40; (13) §50.34; (14) §50.66; and (15) §72.3. Thus, it cannot be gainsaid that the NRC regards application of the ALARA standard as a fundamental radiation protection principle.

<sup>18</sup> This Court had no difficulty in understanding, and aptly summarizing, Shieldalloy’s position: Shieldalloy argued “that while New Jersey’s standards may be more stringent, they are actually less safe. Because of the higher stringency, Shieldalloy states that it is prevented from using on-site disposal and will be forced to ship the materials to a facility in Utah. The consequence is that the doses of radiation to the public resulting from removing the

Shieldalloy's "fundamentally inaccurate" assertion that there is a need to compare the radiological doses that would result from the decommissioning of a facility under unrestricted release and restricted release approaches and to apply the ALARA principle to select the option that results in the lowest doses. CLI-11-12 at 36, JA36.<sup>19</sup>

The NRC's ALARA argument (nowhere expressed before, even in the agency's previous brief before this Court) has three parts. *First*, the NRC claims that, in determining whether decommissioning under restricted release criteria pursuant to 10 C.F.R. §20.1403 should be permitted at a particular site, it need not compare the levels of public health and safety protection afforded by the unrestricted versus restricted release decommissioning options. *Id.* at 37, JA37. *Second*, the NRC claims that, if such a comparison were made, the estimated dose to the public from implementing the restricted decommissioning approach at the

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radioactive materials from the site and relocating them in Utah will actually be *greater* than the public health and environmental harms that accompany on-site disposal of the materials." *Shieldalloy*, 624 F.3d at 496 (citations omitted; emphasis in original).

<sup>19</sup> The LTR "provides criteria for license termination for both 'unrestricted use' and 'restricted use.' Terminating a license for unrestricted use would allow no dependence on 'institutional controls,' *i.e.*, governmental monitoring of engineered barriers and land-use restrictions, to achieve a maximum dose of 25 mrem per year to a member of the public upon termination of the license. Terminating a license for restricted use would rely on legally enforceable institutional controls to achieve the 25 mrem dose limit." CLI-11-12 at 24-25, JA24-25 (footnotes omitted).

Facility would, under certain circumstances, exceed those resulting from decommissioning to unrestricted criteria. *Id.* at 38-39, JA38-39. *Third*, the NRC argues that New Jersey's Program does adopt the ALARA principle, and its failure to allow the use of ALARA in the license termination context is immaterial to the compatibility of the Program with NRC's criteria. *Id.* at 42-44, JA42-44.

The first (and principal) NRC argument is clearly erroneous and inconsistent with the agency's own regulations and guidance and even its licensing communications with Shieldalloy. In establishing decommissioning subject to restricted release criteria as a permissible option, the Statement of Considerations for the LTR calls for a comparison of the radiological impacts associated with the two (restricted and unrestricted release) decommissioning approaches. It states that

[t]o support a request for restricted use, a licensee would perform an ALARA analysis of the risks and benefits of all viable alternatives and include consideration of any detriments. This could include estimated fatalities from transportation accidents that might occur as the result of transport of wastes from cleanup activities, and societal and socioeconomic considerations such as the potential value to the community of unrestricted use of the land.

62 Fed. Reg. at 39,069.

Likewise, 10 C.F.R. § 20.1403 requires a comparison between the two decommissioning approaches because it states that a licensee is eligible for

restricted release if it can either show *that pursuing the unrestricted release option would result in net harm or that the restricted release decommissioning option is ALARA*. 10 C.F.R. § 20.1403. This provision calls for a comparison of the doses associated with the two different decommissioning approaches because the restricted release option is only available if the radiation levels it produces are ALARA or the unrestricted release option would result in radiological harm.

The NRC's own guidance on license termination confirms that consideration of the restricted release option calls for comparing the restricted and unrestricted release options, and choosing the one with the lowest radiological impact. The NRC's main decommissioning guidance document (NUREG-1757, (Consolidated Decommissioning Guidance (Sept. 2006)), JA162), points to certain benefits to be taken into consideration in ALARA cost-benefit calculations, which are important primarily in "*comparisons between restricted and unrestricted release*." R9 (NUREG 1757), Vol. 2 at 6-3, JA253 (emphasis added). In addition, that guidance document refers to "regulatory costs avoided" as a "benefit [that] usually manifests in *ALARA analyses of restricted release versus unrestricted release decommissioning goals*" because "[b]y releasing the site with no restrictions, the licensee may avoid the various costs associated with restricted release." *Id.* at N-6, JA263 (emphasis added).

Finally, the NRC asserts that some of the Requests for Additional Information (“RAIs”) issued by the Staff to Shieldalloy support the agency’s assertion that Shieldalloy has misunderstood application of the ALARA principle in evaluating the restricted release decommissioning option. CLI-11-12 at 35 & n.112, JA35 (citing RAI Nos. 27, 28, 29, and 30). However, each of these RAIs asked Shieldalloy to demonstrate its eligibility for license termination under the restricted release option, but did not touch on the need to compare the restricted and unrestricted release options. On the other hand, another of the Staff requests – RAI number 31, not cited by the NRC – in fact supports Shieldalloy’s position that the ALARA principle calls for a comparison between the doses associated with the restricted and unrestricted release options. That request stated that “[b]ased on the wording of 10 CFR 20.1403(a), the NRC staff considers that the demonstration of compliance should evaluate incremental measures that could be taken to comply with the unrestricted use criteria...If the amount of remediation work is overestimated, then the cost of the [unrestricted use] alternative would also be overestimated, which would bias the net harm or *ALARA comparison* away from the unrestricted use option.” *Request for Additional Information for Safety Review of Proposed Decommissioning Plan for Shieldalloy Metallurgical Corporation, Newfield, New Jersey* (License No. SMB-743), Enclosure, request number 31 (July 5, 2007) (incorporated into record by R57 (CLI-11-12)), JA393 (emphasis added).

Thus, there can be no doubt that dose comparisons between the unrestricted and restricted release options are not only permissible, but *required* by the NRC regulations and guidance.<sup>20</sup> The NRC argues, however, that such comparisons are impossible because the restricted option is complex and subject to many uncertainties that are not present if the site is decommissioned to unrestricted use criteria. CLI-11-12 at 37-38, JA37-38. The NRC cites a potential scenario in which all institutional controls that are part of the restricted release option are assumed to fail and the protective cover isolating the Materials is assumed to degrade, and points out that in such a scenario the resulting doses from the Facility would be 86 mrem per year, a dose in excess of the 1 to 25 mrem per year resulting from the unrestricted release option. *Id.* at 38-39, JA38-39. The NRC fails to point out, however, that its regulations require licensees proposing to decommission a site under restricted release criteria to demonstrate by analysis that “[r]esidual radioactivity at the site has been reduced so that if the institutional

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<sup>20</sup> While the NRC argues that the unrestricted release option is favored under the LTR, (CLI-11-12 at 39, JA39), this argument proves nothing. The restricted release option was established precisely for situations in which such an option could be preferable. As explained in the Statement of Considerations for the LTR: “Experience with decommissioning of facilities since 1988 has indicated that for certain facilities, achieving unrestricted use might not be appropriate because there may be net public or environmental harm in achieving unrestricted use, or because expected future use of the site would likely preclude unrestricted use, or because the cost of site cleanup and waste disposal to achieve unrestricted use is excessive compared to achieving the same dose criterion by restricting use of the site and eliminating exposure pathways.” 62 Fed. Reg. at 39,069, JA77.

controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed . . . 100 mrem (1 mSv) per year.” 10 C.F.R. § 20.1403(e) (2011). Such an analysis does not reflect either the intent or the expectation of exercising the restricted release option, nor does it provide a fair comparison to the results of implementing the unrestricted release option. What the regulations require is that a licensee “has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year.” 10 C.F.R. § 20.1403(b) (2011). As the NRC acknowledges, Shieldalloy’s analysis shows that under the restricted release option implemented in accordance with 10 C.F.R. § 20.1403(b) releases from the remediated Facility would be “infinitesimally small,” i.e., “0.0000004 mrem per year,” well below those resulting from implementation of the unrestricted release option. CLI-11-12 at 38, JA38. A fair comparison between the two options is possible and in fact shows that, for the Facility, the restricted release option is preferable from the ALARA standpoint.

The NRC’s third ALARA argument is that New Jersey has “incorporat[ed] by reference” 10 C.F.R. § 20.1101(b) into its regulations and has adopted the

ALARA principle for “its entire regulatory program.” CLI-11-12 at 42, JA42.<sup>21</sup>

This argument is erroneous, for adherence to the general provisions of 10 C.F.R. § 20.1101(b) says nothing as to whether compliance with ALARA will be required in the process of terminating a license. Indeed, as the NRC concedes, New Jersey does not permit application of ALARA to the license termination process, by excluding the license termination provisions of Subpart E of 10 C.F.R. Part 20 from its regulations. By contrast, the NRC requires compliance with the ALARA principle in three provisions relating to license termination: (1) 10 C.F.R. § 20.1402 (Radiological Criteria for Unrestricted Use); (2) 10 C.F.R. § 20.1403 (Criteria for License Termination Under Restricted Conditions); and (3) 10 C.F.R. § 20.1404 (Alternate Criteria for License Termination). New Jersey’s Program excludes all three. N.J. Admin. Code § 7:28-6.1(c) (2011).

Thus, New Jersey’s Program does not permit application of the ALARA principle to determine the most suitable option for decommissioning a facility and terminating its license. The failure of the Program to allow the ALARA principle to be applied to the termination of facility licenses renders the Program incompatible with the NRC regulatory scheme because it fails to achieve the

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<sup>21</sup> 10 C.F.R. § 20.1101(b) (2011) reads: “The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).”

essential objective of the LTR, that is, “to ensure that decommissioning will be carried out without undue impact on public health and safety and the environment.” 62 Fed. Reg. at 39,058, JA66.

**B. New Jersey’s Program fails to permit license termination subject to restricted release criteria**

Shieldalloy has repeatedly asserted that the New Jersey regulations do not allow the termination of a license based on remediation to restricted release criteria, and would refuse to permit materials to remain on-site if remediation is to be followed by long-term control by a government agency. *See, e.g.*, R53 (Shieldalloy's Response to the Commission's January 3, 2011 Order (Feb. 4, 2011)) at 16, JA715. In CLI-11-12, the NRC seeks to refute Shieldalloy’s argument by stating that New Jersey has two restricted-release options that permit license termination under specified soil concentration levels, and that the regulations also allow for a licensee to petition for restricted release using alternative remediation standards. CLI-11-12 at 44-45, JA44-45. The NRC cites provisions in New Jersey Administrative Code § 7:28-12 in support of its position. *Id.* The NRC accuses Shieldalloy of complaining that the New Jersey license termination regulations are just more conservative than the NRC’s, a situation the NRC finds permissible given the Category C designation of the LTR. *Id.* at 45-46, JA45-46.

The NRC confuses the New Jersey *site remediation* standards with the State's requirements for *license termination*. Such confusion leads the NRC to argue that it would be possible for a licensee to terminate its license after remediating its site to meet restrictive release criteria. That is not the case.

The New Jersey regulations do reference "restricted use" remedial actions, thus implying that remediation to a restricted-release condition is permissible under certain, limited circumstances. Among the regulations referring to restricted use remediation are the Remediation Standards for Radioactive Materials definitions, which include definitions for "limited restricted-use remedial action" (a remedial action that relies upon institutional controls but not engineering controls) and "restricted use remedial action" (a remedial action that relies upon both engineering controls and institutional controls to meet the established health risk or environmental standards). N.J. Admin. Code § 7:28-12.3 (2011). In addition, another regulation provides the relevant radiation dose standards and dictates that all sites, whether remediated under an unrestricted use, limited restricted-use, or restricted use remedial action, must be remediated such that the applicable dose is less than 15 mrem per year. N.J. Admin. Code § 7:28-12.8 (2011).

However, the New Jersey regulations do not allow for the *termination* of a license if restricted-use conditions are satisfied. While New Jersey may allow a site to be remediated to a restricted-use status, the licensee retains responsibility for the site under a “remedial action permit” issued by the State, and must continue to take such remedial actions as are necessary to comply with the remedial action permit terms. *See* N.J. Admin. Code § 7:26C-7 (2011). A remedial action permit can be terminated only if the permittee demonstrates in writing that engineering or institutional controls (or the other remedial actions implemented for a site) are no longer required to be protective of public health and safety and the environment. N.J. Admin. Code § 7:26C-7.10(b) (2011). Thus, a remedial action permit would continue in effect, and the licensee would retain responsibility for a site, as long as engineering or institutional controls need to be maintained.

Termination of a materials license in New Jersey is governed by N.J. Admin. Code § 7:28-58. That regulation requires that, to obtain license termination, a licensee must provide evidence demonstrating that the site meets the radiation dose standards set forth in N.J. Admin. Code § 7:28-12. *See* N.J. Admin. Code § 7:28-58.1; 10 C.F.R. § 40.42(j)(2) & (k)(3) (2011). In addition, the licensee must provide a disposition certificate attesting to disposal of radioactive

material.<sup>22</sup> This certificate requires that the licensee certify that all radioactive materials have been disposed of in some manner and that a radiation survey has confirmed the absence of licensed radioactive materials at the site. Such a certification could not be made (and thus the license could not be terminated) if radioactive materials were to be capped and remain on-site.

The unavailability of license termination under restricted release conditions is further confirmed by the fact that New Jersey does not allow for long-term control of a remediated site by a government agency. Although N.J. Admin. Code § 7:28-58.1 largely incorporates by reference the NRC's source material regulations at 10 C.F.R. Part 40, it does not incorporate 10 C.F.R. § 40.27, the NRC regulation that provides a license for custody and long-term care of residual radioactive material disposal sites by a federal government agency.<sup>23</sup>

The NRC does not explain how it could find New Jersey's Program compatible with its regulations in the area of facility decommissioning when the Program fails to implement an important aspect of the LTR – terminating a license

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<sup>22</sup> NJRAD Form 314, *available at* <http://www.state.nj.us/dep/rpp/rms/forms.htm> (“Termination”), JA446-47.

<sup>23</sup> Likewise, the New Jersey Department of Environmental Protection has made clear in its written communications to Shieldalloy that the New Jersey regulations do not allow for issuance of a long-term care and control license. *See* R53 (Shieldalloy's Response to the Commission's January 3, 2011 Order (Feb. 4, 2011)) at 16 n.26, JA715.

under “restricted conditions” pursuant to which radioactive materials are allowed to remain at a site subject to specified controls, including supervision by a government agency. The inconsistency is glaring since the NRC had devoted much effort to developing this particular licensing mechanism as a way to meet the essential objective of the LTR: minimizing public exposures to radiation.

**C. New Jersey’s Program fails to implement numerous requirements of the NRC regulations**

The NRC seeks to justify the numerous departures of New Jersey’s Program from the NRC regulations by invoking the LTR’s status as a “Compatibility Category C” regulation and finding that, despite those departures, New Jersey’s approach “embodies the ‘essential objective’ of [its] license termination rule.” CLI-11-12 at 47, JA47.

The “essential objective” of a regulation or program element is the “action that is to be achieved, modified, or prevented by implementing and following the regulation or program element. In some instances, the essential objective may be a numerical value (e.g., restriction of exposures to a maximum value) or it may be a more general goal (e.g. access control to a restricted area).” NRC Directive 5.9 “Adequacy and Compatibility of Agreement State Programs,” (Feb. 1998) at 17 (available at <http://pbadupws.nrc.gov/docs/ML0417/ML041770094.pdf>). The NRC itself has identified the essential objective of the LTR as “to provide specific

radiological criteria for the decommissioning of lands and structures...to *ensure that decommissioning will be carried out without undue impact on public health and safety and the environment.*” CLI-11-12 at 47, JA47 (quoting 62 Fed. Reg. at 39,058; emphasis added).

As discussed earlier, the NRC program for the regulation of radioactive materials calls for an ALARA comparison between restricted and unrestricted release decommissioning options, which New Jersey’s Program prohibits. The Program also does not allow for license termination under a restricted release option, which the NRC program permits. In these respects, the Program does not fulfill the essential objective of the LTR, because these failures of the Program increase the likelihood of licensed activities having an undue impact on public health and the environment.

In addition, in its comments on New Jersey’s Program, Shieldalloy pointed out other respects in which the facility decommissioning elements of the Program deviate from the provisions of the LTR. As acknowledged by the NRC, those deviations include: “(1) New Jersey’s 15 mrem per year dose limit, versus our 25 mrem per year dose limit; (2) New Jersey’s calculation of doses to the longer of the time of peak dose or 1000 years, versus our calculation limited to the first 1000 years of decommissioning; (3) New Jersey’s failure to allow for potential doses

over 100 mrem per year, versus our allowance of 500 mrem under certain circumstances; and (4) New Jersey's requirement that radioactively contaminated ground and surface water be remediated in accordance with New Jersey water quality requirements, versus our 'all pathways' approach without a separate release standard for water." CLI-11-12 at 46-47, JA46-47 (footnote omitted). Despite acknowledging that "[t]he New Jersey variances cited by Shieldalloy are aspects of the state's regulations that are more stringent than ours on the same technical subject areas," (*id.* at 47), and that New Jersey's Program "is considerably more stringent than ours, (*id.* at 49), the NRC dismisses these differences as permissible given the Category C classification of the LTR. *Id.* at 47, JA47.<sup>24</sup>

Invoking the Category C classification of the LTR, however, is insufficient justification for accepting the Program's "considerably more stringent" approach to

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<sup>24</sup> The Court in *Shieldalloy* noted that, while the LTR is part of the NRC's regulatory program, it is not included in the NRC Criteria Document (R1, JA53). *Shieldalloy*, 624 F.3d at 496. The Court found this "odd," given that the Criteria Document otherwise tracks the various subparts of 10 C.F.R. Part 20 quite closely and that the Staff seems to follow the Criteria Document "religiously" in assessing the compatibility of the state and federal programs. *Id.* Although the LTR was issued after the Criteria Document, the Court stated that it was not clear "that a simple temporal distinction would justify deviation from § 2021(d)'s apparent statutory requirement to ensure the compatibility of the state program with the federal." *Id.* at 497. The Court suggested that "the NRC may have an account of the role of the LTR in its regulatory scheme that it had no occasion to present." *Id.* However, in CLI-11-12 the NRC failed to provide an explanation for this anomaly.

license termination. In adopting the LTR, the NRC spent three years developing “a clear and consistent regulatory basis for determining the extent to which lands and structures must be remediated before decommissioning of a site can be considered complete and the license terminated.” 62 Fed. Reg. at 39,058, JA66. The rule, as it emerged, took into account the comments of over 100 organizations and individuals representing a wide range of views. *Id.* at 39,059, JA67. In fact, each aspect of New Jersey’s Program that is at odds with the LTR was suggested to the NRC in comments on the proposed LTR and, after being analyzed in depth, was explicitly rejected by the NRC.

Because of these differences, the facility decommissioning elements of New Jersey’s Program are not only “considerably more stringent,” but in fact inconsistent and incompatible with those in the NRC regulations.

**V. THE NRC ERRED IN REINSTATING THE TRANSFER OF AUTHORITY OVER THE FACILITY BECAUSE NEW JERSEY’S PROGRAM FAILS TO ASSURE THE FAIR AND IMPARTIAL ADMINISTRATION OF REGULATORY LAW**

Compatibility Criterion 23 states in relevant part:

Administration... State practices for assuring the fair and impartial administration of regulatory law, including provision for public participation where appropriate, should be incorporated in procedures for: a. Formulation of rules of general applicability.

46 Fed. Reg. at 7,543, JA56. It is uncontested that, in the area of facility license termination, the regulations that implement New Jersey’s Program apply only to

the Facility. Indeed, numerous aspects of the New Jersey regulations apply only to the Facility, including among others: (a) the refusal to apply the ALARA standard; (b) the refusal to allow the use of restricted release criteria for license termination; (c) the requirement of peak dose computation beyond 1,000 years; (d) the requirement to calculate potential doses using only specific exposure scenarios and input parameters; and (e) the failure to allow credit for the rate of degradation of engineering controls over time. Their combined effect is to preclude any possibility that the Facility could be decommissioned in accordance with standards similar to those in Subpart E of 10 C.F.R. Part 20.

The NRC, however, does not “see anything unfair or unlawful in state regulations that may apply to just one licensee in a state at any given time.” CLI-11-12 at 48, JA48. Of course, what is involved here is not just a happenstance. There is only one site in New Jersey to which these provisions will ever apply: the Facility. There are no other “legacy sites” in New Jersey containing source materials to which these regulations would apply at some future time. It is also extremely improbable, if not impossible, that a new facility where source materials are used will in the future be licensed under New Jersey’s radiation control rules. New Jersey acknowledges as much in its Agreement State application: “Presently, New Jersey has only one Source Material licensee that is undergoing decommissioning and does not expect any applications for new source material

licenses.” R23 (NJ Agreement Application), Section 4.3.1 at 2, JA444. Seen in that light, the unique nature of the target of these regulations should have caused the NRC to focus on their fairness and their potential inconsistency with Criterion 23.

The NRC claims that “New Jersey’s program incorporates all of the regulatory components specified in Criterion 23,” including that it set rules of general applicability. CLI-11-12 at 48, JA48. A review of the NJDEP regulations, however, reveals that they were not formulated to be “rules of general applicability.” Instead, they were developed as special provisions targeted at the Facility, intended to force the removal of the Materials stored there. Again, the NRC finds nothing wrong with this. It does not “view a state’s regulations as inherently unfair because they may be designed to effectuate a state-desired regulatory outcome.” *Id.* The outcome-oriented nature of the regulations, however, should have triggered increased scrutiny by the NRC to verify that the Program will be administered fairly and impartially. This is particularly the case where the proposed program applies only to one licensee and is considerably more stringent than the NRC’s own standards.

Criterion 23 requires that New Jersey’s Program “assur[e] the fair and impartial administration of regulatory law.” 46 Fed. Reg. at 7,543, JA56. In

making a determination that would seal the fate of the Facility, the NRC had the duty to ensure that the Program incorporated the requisite fairness. *See Hannah v. Larche*, 363 U.S. 420, 442 (1960) (“[W]hen governmental agencies adjudicate or make binding determinations which directly affect legal rights of individuals, it is imperative that those agencies use procedures which have traditionally been associated with judicial process.”); *see also Amos Treat & Co. v. SEC*, 306 F.2d 260, 264 (D.C. Cir. 1962) (noting that “with respect to agency adjudicatory proceedings, due process might be said to mean at least ‘fair play’”). Instead of demonstrating “fairness and impartiality” in developing “rules of general applicability” to implement its proposed Program, New Jersey stacked the deck against Shieldalloy in a manner that departs from notions of fair play and substantial justice.

Thus, the NRC action in turning a blind eye to the provisions in New Jersey’s Program aimed at the Facility was arbitrary and capricious.

**VI. THE COMBINED EFFECT OF ALL OF THE DEPARTURES OF THE NEW JERSEY PROGRAM FROM THE NRC’S REGULATORY SCHEME RENDERS THE NRC’S REINSTATEMENT OF THE TRANSFER OF AUTHORITY OVER THE FACILITY ARBITRARY AND CAPRICIOUS**

Each of the instances of incompatibility between New Jersey’s Program and the NRC regulations is sufficient in itself to invalidate the NRC’s transfer of regulatory authority over the Facility to New Jersey. In addition, it is well settled

that in reviewing agency action under the “arbitrary or capricious” standard, a court will consider the record as a whole. *See, e.g., Am. Wildlands v. Kempthorne*, 530 F.3d 991, 1002 (D.C. Cir. 2008); *Carpenters & Millwrights Local Union 2471 v. NLRB*, 481 F.3d 804, 808-09 (D.C. Cir. 2007). Examining the totality of the NRC actions in disregard of this Court’s directive in *Shieldalloy*, its own regulations, its Compatibility Criteria, and the requirements of the AEA compels the conclusion that the NRC acted in an arbitrary and capricious manner when it reinstated its transfer of authority over the Facility to New Jersey instead of retaining jurisdiction over it.

The arbitrary and capricious actions of the NRC, individually and taken together, warrant that the Court invalidate the NRC's reinstatement of the transfer of authority. Consequently, the matter should be again remanded to the NRC with instructions that the agency rescind the transfer and reinstate its authority over the Facility.<sup>25</sup>

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<sup>25</sup> The NRC posits that, despite its reinstatement of regulatory authority over the Facility to New Jersey, *Shieldalloy* is not without recourse. “If a regulated entity believes that a state’s program, as implemented, is unlawful or contrary to public health and safety, it may raise its agreement-state performance concerns with us. NRC will address agreement-state performance concerns through our Integrated Materials Performance Evaluation Program (IMPEP) process or through an independent agreement-state performance concern evaluation, depending on the performance concern raised. We retain power under AEA section 274j., to revoke

## CONCLUSION

In *Shieldalloy*, this Court agreed with Shieldalloy's two central challenges to the NRC's original transfer of regulatory authority to New Jersey: (1) that "New Jersey's program is incompatible with the federal scheme" and (2) that "the transfer of authority was arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Shieldalloy*, 624 F.3d at 491 (quotation and citation omitted). In CLI-11-12, the NRC ignored both findings, failed to adequately explain the applicability of Criterion 25, and persisted in trying to justify its prior erroneous actions.

The NRC's recalcitrance warrants that the Court again remand the case with instructions that the agency rescind its transfer of regulatory authority over the Facility to New Jersey and reinstate its authority over it.

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agreements with states and to restore NRC regulatory authority." CLI-11-12 at 49, JA49 (footnotes omitted). However, Shieldalloy has already raised its objections to the transfer of authority – before the original transfer took place in 2009, in a motion to the NRC for a stay of the transfer pending judicial review, again before this Court leading to the *Shieldalloy* decision, and one more time in submittals to the NRC after the case was remanded to the agency. Each time, the NRC rejected Shieldalloy's objections and concerns. The NRC has been on notice that, once given regulatory authority over the Facility, New Jersey will force the removal of the Materials from the Facility. Thus, the post-transfer actions that the NRC suggests Shieldalloy take would be an exercise in futility. Pursuing an administrative remedy is futile where an "agency has articulated a very clear position on the issue which it has demonstrated it would be unwilling to reconsider." *Randolph-Sheppard Vendors of Am. v. Weinberger*, 795 F.2d 90, 105 (D.C. Cir. 1986); see also *James v. HHS*, 824 F.2d 1132, 1139 (D.C. Cir. 1987).

Petitioner respectfully requests that the Court grant the above and such other relief as may be appropriate.

Respectfully submitted,

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION**

Pursuant to Rule 32(a)(7)(C) of the Federal Rules of Appellate Procedure, Petitioner's Counsel hereby certifies that the foregoing "Brief of Petitioner Shieldalloy Metallurgical Corporation" complies with the type-volume limitation in Fed. R. App. P. 32(a)(7)(B)(i) in that it contains, exclusive of the certificate as to parties, rulings and related cases; corporate disclosure statement; table of contents; table of authorities; glossary; statement with respect to oral argument; the addendum containing statutes, rules or regulations; and the certificates of counsel, 13,963 words of proportionally spaced, 14 point Times New Roman font text.

In making this certification, Counsel has relied on the word count function of Microsoft Word, the word-processing system used to prepare this brief.

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Dated: July 26, 2012

**CERTIFICATE OF SERVICE**

I hereby certify, in accordance with Circuit Rule 31, that the electronic original and five paper copies of the foregoing Brief of Petitioner Shieldalloy Metallurgical Corporation (the "Brief") were filed with the Clerk of the Court this 26<sup>th</sup> day of July 2012. In addition, on this 26<sup>th</sup> day of July 2012, paper copies of the Brief were served on the following participants in the case by United States first class mail, postage prepaid:

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**ADDENDUM**  
**REFERENCED STATUTES AND REGULATIONS**

5 U.S.C. § 558(c) (2006).....	1
5 U.S.C. § 706(2)(A) (2006).....	3
28 U.S.C. § 2342(4) (2006) .....	4
28 U.S.C. § 2343 (2006) .....	5
28 U.S.C. § 2344 (2006) .....	5
Atomic Energy Act of 1954, as amended, § 274.....	6
42 U.S.C. § 2021 (2006).....	10
42 U.S.C. § 2239 (2006) .....	15
10 C.F.R. § 8.4(b) (2011).....	18
10 C.F.R. § 20.1003 (2011) .....	21
10 C.F.R. § 20.1101 (2011) .....	29
10 C.F.R. § 20.1206 (2011) .....	30
10 C.F.R. § 20.1301 (2011) .....	31
10 C.F.R. Part 20, Subpart E; 10 C.F.R. §§ 20.1401-06 (2011).....	32
10 C.F.R. § 20.1402 (2011) .....	33
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10 C.F.R. § 20.1702 (2011) .....	38
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N.J. Admin. Code § 7:28-58.1 (2011) .....	149
N.J. Stat. Ann. § 26:2D-9(k) (2011) .....	154

(A) no interested person outside the agency shall make or knowingly cause to be made to any member of the body comprising the agency, administrative law judge, or other employee who is or may reasonably be expected to be involved in the decisional process of the proceeding, an ex parte communication relevant to the merits of the proceeding;

(B) no member of the body comprising the agency, administrative law judge, or other employee who is or may reasonably be expected to be involved in the decisional process of the proceeding, shall make or knowingly cause to be made to any interested person outside the agency an ex parte communication relevant to the merits of the proceeding;

(C) a member of the body comprising the agency, administrative law judge, or other employee who is or may reasonably be expected to be involved in the decisional process of such proceeding who receives, or who makes or knowingly causes to be made, a communication prohibited by this subsection shall place on the public record of the proceeding:

- (i) all such written communications;
- (ii) memoranda stating the substance of all such oral communications; and
- (iii) all written responses, and memoranda stating the substance of all oral responses, to the materials described in clauses (i) and (ii) of this subparagraph;

(D) upon receipt of a communication knowingly made or knowingly caused to be made by a party in violation of this subsection, the agency, administrative law judge, or other employee presiding at the hearing may, to the extent consistent with the interests of justice and the policy of the underlying statutes, require the party to show cause why his claim or interest in the proceeding should not be dismissed, denied, disregarded, or otherwise adversely affected on account of such violation; and

(E) the prohibitions of this subsection shall apply beginning at such time as the agency may designate, but in no case shall they begin to apply later than the time at which a proceeding is noticed for hearing unless the person responsible for the communication has knowledge that it will be noticed, in which case the prohibitions shall apply beginning at the time of his acquisition of such knowledge.

(2) This subsection does not constitute authority to withhold information from Congress.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 387; Pub. L. 94-409, § 4(a), Sept. 13, 1976, 90 Stat. 1246.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1007.	June 11, 1946, ch. 324, § 8, 60 Stat. 242.

In subsection (b), the word "employee" is substituted for "officer" and "officers" in view of the definition of "employee" in section 2105. The word "either" is added after the word "requires" in the first sentence to eliminate the need for parentheses. The words "the presiding employee or an employee qualified to preside at hearings under section 556 of this title" are substituted for

"such officers" in the last sentence. The word "initial" is omitted before "decision", the final word in the first sentence and the sixth word of the fourth sentence, to avoid confusion between the "initial decision" of the presiding employee and the "initial decision" of the agency.

In subsection (c), the word "employees" is substituted for "officers" in view of the definition of "employee" in section 2105.

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface to the report.

## CODIFICATION

Section 557 of former Title 5, Executive Departments and Government Officers and Employees, was transferred to section 2207 of Title 7, Agriculture.

Section 557a of former Title 5, Executive Departments and Government Officers and Employees, was transferred to section 2208 of Title 7.

## AMENDMENTS

1976—Subsec. (d). Pub. L. 94-409 added subsec. (d).

## EFFECTIVE DATE OF 1976 AMENDMENT

Amendment by Pub. L. 94-409 effective 180 days after Sept. 13, 1976, see section 6 of Pub. L. 94-409, set out as an Effective Date note under section 552b of this title.

### § 558. Imposition of sanctions; determination of applications for licenses; suspension, revocation, and expiration of licenses

(a) This section applies, according to the provisions thereof, to the exercise of a power or authority.

(b) A sanction may not be imposed or a substantive rule or order issued except within jurisdiction delegated to the agency and as authorized by law.

(c) When application is made for a license required by law, the agency, with due regard for the rights and privileges of all the interested parties or adversely affected persons and within a reasonable time, shall set and complete proceedings required to be conducted in accordance with sections 556 and 557 of this title or other proceedings required by law and shall make its decision. Except in cases of willfulness or those in which public health, interest, or safety requires otherwise, the withdrawal, suspension, revocation, or annulment of a license is lawful only if, before the institution of agency proceedings therefor, the licensee has been given—

(1) notice by the agency in writing of the facts or conduct which may warrant the action; and

(2) opportunity to demonstrate or achieve compliance with all lawful requirements.

When the licensee has made timely and sufficient application for a renewal or a new license in accordance with agency rules, a license with reference to an activity of a continuing nature does not expire until the application has been finally determined by the agency.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 388.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1008.	June 11, 1946, ch. 324, § 9, 60 Stat. 242.

In subsection (b), the prohibition is restated in positive form.

In subsection (c), the words "within a reasonable time" are substituted for "with reasonable dispatch". The last two sentences are restated for conciseness and clarity and to restate the prohibition in positive form. Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface to the report.

## CODIFICATION

Section 558 of former Title 5, Executive Departments and Government Officers and Employees, was transferred to section 2209 of Title 7, Agriculture.

**§ 559. Effect on other laws; effect of subsequent statute**

This subchapter, chapter 7, and sections 1305, 3105, 3344, 4301(2)(B), 5372, and 7521 of this title, and the provisions of section 5335(a)(B) of this title that relate to administrative law judges, do not limit or repeal additional requirements imposed by statute or otherwise recognized by law. Except as otherwise required by law, requirements or privileges relating to evidence or procedure apply equally to agencies and persons. Each agency is granted the authority necessary to comply with the requirements of this subchapter through the issuance of rules or otherwise. Subsequent statute may not be held to supersede or modify this subchapter, chapter 7, sections 1305, 3105, 3344, 4301(2)(B), 5372, or 7521 of this title, or the provisions of section 5335(a)(B) of this title that relate to administrative law judges, except to the extent that it does so expressly.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 388; Pub. L. 90-623, §1(1), Oct. 22, 1968, 82 Stat. 1312; Pub. L. 95-251, §2(a)(1), Mar. 27, 1978, 92 Stat. 183; Pub. L. 95-454, title VIII, §801(a)(3)(B)(iii), Oct. 13, 1978, 92 Stat. 1221.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1011.	June 11, 1946, ch. 324, §12, 60 Stat. 244.

In the first and last sentences, the words "This subchapter, chapter 7, and sections 1305, 3105, 3344, 4301(2)(B), 5362, and 7521, and the provisions of section 5335(a)(B) of this title that relate to hearing examiners" are substituted for "this Act" to reflect the codification of the Act in this title. The words "to diminish the constitutional rights of any person or" are omitted as surplusage as there is nothing in the Act that can reasonably be construed to diminish those rights and because a statute may not operate in derogation of the Constitution.

The third sentence of former section 1011 is omitted as covered by technical section 7. The sixth sentence of former section 1011 is omitted as executed.

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface to the report.

## AMENDMENTS

1978—Pub. L. 95-454 substituted "5372" for "5362" wherever appearing.

Pub. L. 95-251 substituted "administrative law judges" for "hearing examiners" wherever appearing.

1968—Pub. L. 90-623 inserted "of this title" after "7521" wherever appearing.

## EFFECTIVE DATE OF 1978 AMENDMENT

Amendment by Pub. L. 95-454 effective on first day of first applicable pay period beginning on or after the

90th day after Oct. 13, 1978, see section 801(a)(4) of Pub. L. 95-454, set out as an Effective Date note under section 5361 of this title.

## EFFECTIVE DATE OF 1968 AMENDMENT

Amendment by Pub. L. 90-623 intended to restate without substantive change the law in effect on Oct. 22, 1968, see section 6 of Pub. L. 90-623, set out as a note under section 5334 of this title.

## SUBCHAPTER III—NEGOTIATED RULEMAKING PROCEDURE

## PRIOR PROVISIONS

A prior subchapter III (§571 et seq.) was redesignated subchapter V (§591 et seq.) of this chapter.

## AMENDMENTS

1992—Pub. L. 102-354, §3(a)(1), Aug. 26, 1992, 106 Stat. 944, redesignated subchapter IV of this chapter relating to negotiated rulemaking procedure as this subchapter.

**§ 561. Purpose**

The purpose of this subchapter is to establish a framework for the conduct of negotiated rulemaking, consistent with section 553 of this title, to encourage agencies to use the process when it enhances the informal rulemaking process. Nothing in this subchapter should be construed as an attempt to limit innovation and experimentation with the negotiated rulemaking process or with other innovative rulemaking procedures otherwise authorized by law.

(Added Pub. L. 101-648, §3(a), Nov. 29, 1990, 104 Stat. 4970, §581; renumbered §561, Pub. L. 102-354, §3(a)(2), Aug. 26, 1992, 106 Stat. 944.)

## AMENDMENTS

1992—Pub. L. 102-354 renumbered section 581 of this title as this section.

## EFFECTIVE DATE OF REPEAL; SAVINGS PROVISION

Section 5 of Pub. L. 101-648, as amended by Pub. L. 102-354, §5(a)(2), Aug. 26, 1992, 106 Stat. 945, which provided that subchapter III of chapter 5 of title 5 and the table of sections corresponding to such subchapter, were repealed, effective 6 years after Nov. 29, 1990, except for then pending proceedings, was repealed by Pub. L. 104-320, §11(a), Oct. 19, 1996, 110 Stat. 3873.

## SHORT TITLE OF 1992 AMENDMENT

Section 1 of Pub. L. 102-354 provided that: "This Act [amending sections 565, 568, 569, 571, 577, 580, 581, and 593 of this title, section 10 of Title 9, Arbitration, and section 173 of Title 29, Labor, renumbering sections 571 to 576, 581 to 590, and 581 to 593 as 591 to 596, 561 to 570, and 571 to 583, respectively, of this title, and amending provisions set out as notes under this section and section 571 of this title] may be cited as the 'Administrative Procedure Technical Amendments Act of 1991'."

## SHORT TITLE OF 1990 AMENDMENT

Section 1 of Pub. L. 101-648 provided that: "This Act [enacting this subchapter] may be cited as the 'Negotiated Rulemaking Act of 1990'."

## CONGRESSIONAL FINDINGS

Section 2 of Pub. L. 101-648 provided that: "The Congress makes the following findings:

"(1) Government regulation has increased substantially since the enactment of the Administrative Procedure Act [see Short Title note set out preceding section 551 of this title].

"(2) Agencies currently use rulemaking procedures that may discourage the affected parties from meet-

prohibitory or mandatory injunction or habeas corpus, in a court of competent jurisdiction. If no special statutory review proceeding is applicable, the action for judicial review may be brought against the United States, the agency by its official title, or the appropriate officer. Except to the extent that prior, adequate, and exclusive opportunity for judicial review is provided by law, agency action is subject to judicial review in civil or criminal proceedings for judicial enforcement.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 392; Pub. L. 94-574, § 1, Oct. 21, 1976, 90 Stat. 2721.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1009(b).	June 11, 1946, ch. 324, § 10(b), 60 Stat. 243.

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface to the report.

## AMENDMENTS

1976—Pub. L. 94-574 provided that if no special statutory review proceeding is applicable, the action for judicial review may be brought against the United States, the agency by its official title, or the appropriate officer as defendant.

## § 704. Actions reviewable

Agency action made reviewable by statute and final agency action for which there is no other adequate remedy in a court are subject to judicial review. A preliminary, procedural, or intermediate agency action or ruling not directly reviewable is subject to review on the review of the final agency action. Except as otherwise expressly required by statute, agency action otherwise final is final for the purposes of this section whether or not there has been presented or determined an application for a declaratory order, for any form of reconsideration, or, unless the agency otherwise requires by rule and provides that the action meanwhile is inoperative, for an appeal to superior agency authority.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 392.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1009(c).	June 11, 1946, ch. 324, § 10(c), 60 Stat. 243.

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface of this report.

## § 705. Relief pending review

When an agency finds that justice so requires, it may postpone the effective date of action taken by it, pending judicial review. On such conditions as may be required and to the extent necessary to prevent irreparable injury, the reviewing court, including the court to which a case may be taken on appeal from or on application for certiorari or other writ to a reviewing court, may issue all necessary and appropriate process to postpone the effective date of an agency action or to preserve status or rights pending conclusion of the review proceedings.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 393.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1009(d).	June 11, 1946, ch. 324, § 10(d), 60 Stat. 243.

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface of this report.

## § 706. Scope of review

To the extent necessary to decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. The reviewing court shall—

(1) compel agency action unlawfully withheld or unreasonably delayed; and

(2) hold unlawful and set aside agency action, findings, and conclusions found to be—

(A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law;

(B) contrary to constitutional right, power, privilege, or immunity;

(C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right;

(D) without observance of procedure required by law;

(E) unsupported by substantial evidence in a case subject to sections 556 and 557 of this title or otherwise reviewed on the record of an agency hearing provided by statute; or

(F) unwarranted by the facts to the extent that the facts are subject to trial de novo by the reviewing court.

In making the foregoing determinations, the court shall review the whole record or those parts of it cited by a party, and due account shall be taken of the rule of prejudicial error.

(Pub. L. 89-554, Sept. 6, 1966, 80 Stat. 393.)

## HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1009(e).	June 11, 1946, ch. 324, § 10(e), 60 Stat. 243.

Standard changes are made to conform with the definitions applicable and the style of this title as outlined in the preface of this report.

## ABBREVIATION OF RECORD

Pub. L. 85-791, Aug. 28, 1958, 72 Stat. 941, which authorized abbreviation of record on review or enforcement of orders of administrative agencies and review on the original papers, provided, in section 35 thereof, that: "This Act [see Tables for classification] shall not be construed to repeal or modify any provision of the Administrative Procedure Act [see Short Title note set out preceding section 551 of this title]."

## CHAPTER 8—CONGRESSIONAL REVIEW OF AGENCY RULEMAKING

Sec.  
801.  
802.

Congressional review.  
Congressional disapproval procedure.

suspend orders of Interstate Commerce Commission which are pending when this amendment becomes effective shall not be affected thereby, but shall proceed to final disposition under the law existing on the date they were commenced, see section 10 of Pub. L. 93-584, set out as a note under section 2321 of this title.

#### TRANSFER OF FUNCTIONS

Atomic Energy Commission abolished and functions transferred by sections 5814 and 5841 of Title 42, The Public Health and Welfare. See, also, Transfer of Functions notes set out under those sections.

#### § 2342. Jurisdiction of court of appeals

The court of appeals (other than the United States Court of Appeals for the Federal Circuit) has exclusive jurisdiction to enjoin, set aside, suspend (in whole or in part), or to determine the validity of—

(1) all final orders of the Federal Communication Commission made reviewable by section 402(a) of title 47;

(2) all final orders of the Secretary of Agriculture made under chapters 9 and 20A of title 7, except orders issued under sections 210(e), 217a, and 499g(a) of title 7;

(3) all rules, regulations, or final orders of—

(A) the Secretary of Transportation issued pursuant to section 50501, 50502, 56101-56104, or 57109 of title 46 or pursuant to part B or C of subtitle IV, subchapter III of chapter 311, chapter 313, or chapter 315 of title 49; and

(B) the Federal Maritime Commission issued pursuant to section 305, 41304, 41308, or 41309 or chapter 421 or 441 of title 46;

(4) all final orders of the Atomic Energy Commission made reviewable by section 2239 of title 42;

(5) all rules, regulations, or final orders of the Surface Transportation Board made reviewable by section 2321 of this title;

(6) all final orders under section 812 of the Fair Housing Act; and

(7) all final agency actions described in section 20114(c) of title 49.

Jurisdiction is invoked by filing a petition as provided by section 2344 of this title.

(Added Pub. L. 89-554, §4(e), Sept. 6, 1966, 80 Stat. 622; amended Pub. L. 93-584, §4, Jan. 2, 1975, 88 Stat. 1917; Pub. L. 95-454, title II, §206, Oct. 13, 1978, 92 Stat. 1144; Pub. L. 96-454, §8(b)(2), Oct. 15, 1980, 94 Stat. 2021; Pub. L. 97-164, title I, §137, Apr. 2, 1982, 96 Stat. 41; Pub. L. 98-554, title II, §227(a)(4), Oct. 30, 1984, 98 Stat. 2852; Pub. L. 99-336, §5(a), June 19, 1986, 100 Stat. 638; Pub. L. 100-430, §11(a), Sept. 13, 1988, 102 Stat. 1635; Pub. L. 102-365, §5(c)(2), Sept. 3, 1992, 106 Stat. 975; Pub. L. 103-272, §5(h), July 5, 1994, 108 Stat. 1375; Pub. L. 104-88, title III, §305(d)(5)-(8), Dec. 29, 1995, 109 Stat. 945; Pub. L. 104-287, §6(f)(2), Oct. 11, 1996, 110 Stat. 3399; Pub. L. 109-59, title IV, §4125(a), Aug. 10, 2005, 119 Stat. 1738; Pub. L. 109-304, §17(f)(3), Oct. 6, 2006, 120 Stat. 1708.)

#### HISTORICAL AND REVISION NOTES

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1032.	Dec. 29, 1950, ch. 1189, §2, 64 Stat. 1129. Aug. 30, 1954, ch. 1073, §2(b), 68 Stat. 961.

The words "have exclusive jurisdiction" are substituted for "shall have exclusive jurisdiction".

In paragraph (1), the word "by" is substituted for "in accordance with".

In paragraph (3), the word "now" is omitted as unnecessary. The word "under" is substituted for "pursuant to the provisions of". Reference to "Federal Maritime Commission" is substituted for "Federal Maritime Board" on authority of 1961 Reorg. Plan No. 7, eff. Aug. 12, 1961, 75 Stat. 840. Reference to the United States Maritime Commission is omitted because that Commission was abolished by 1950 Reorg. Plan No. 21, §306, eff. May 24, 1951, 64 Stat. 1277, and any existing rights are preserved by technical sections 7 and 8.

#### REFERENCES IN TEXT

Section 812 of the Fair Housing Act, referred to in par. (6), is classified to section 3612 of Title 42, The Public Health and Welfare.

#### AMENDMENTS

2006—Par. (3)(A). Pub. L. 109-304, §17(f)(3)(A), substituted "section 50501, 50502, 56101-56104, or 57109 of title 46" for "section 2, 9, 37, or 41 of the Shipping Act, 1916 (46 U.S.C. App. 802, 803, 808, 835, 839, and 841a)".

Par. (3)(B). Pub. L. 109-304, §17(f)(3)(B), added subpar. (B) and struck out former subpar. (B) which read as follows:

"(B) the Federal Maritime Commission issued pursuant to—

"(i) section 19 of the Merchant Marine Act, 1920 (46 U.S.C. App. 876);

"(ii) section 14 or 17 of the Shipping Act of 1984 (46 U.S.C. App. 1713 or 1716); or

"(iii) section 2(d) or 3(d) of the Act of November 6, 1966 (46 U.S.C. App. 817d(d) or 817e(d))."

2005—Par. (3)(A). Pub. L. 109-59 inserted ", subchapter III of chapter 311, chapter 313, or chapter 315" before "of title 49".

1996—Par. (3)(A). Pub. L. 104-287 amended Pub. L. 104-88, §305(d)(6). See 1995 Amendment note below.

1995—Par. (3)(A). Pub. L. 104-88, §305(d)(6), as amended by Pub. L. 104-287, inserted "or pursuant to part B or C of subtitle IV of title 49" before the semicolon.

Pub. L. 104-88, §305(d)(5), substituted "or 41" for "41, or 43".

Par. (3)(B). Pub. L. 104-88, §305(d)(7), redesignated cls. (ii), (iv), and (v) as (i), (ii), and (iii), respectively, and struck out former cls. (i) and (iii) which read as follows:

"(i) section 23, 25, or 43 of the Shipping Act, 1916 (46 U.S.C. App. 822, 824, or 841a);

"(iii) section 2, 3, 4, or 5 of the Intercoastal Shipping Act, 1933 (46 U.S.C. App. 844, 845, 845a, or 845b)."

Par. (5). Pub. L. 104-88, §305(d)(8), added par. (5) and struck out former par. (5) which read as follows: "all rules, regulations, or final orders of the Interstate Commerce Commission made reviewable by section 2321 of this title and all final orders of such Commission made reviewable under section 11901(j)(2) of title 49, United States Code."

1994—Par. (7). Pub. L. 103-272 substituted "section 20114(c) of title 49" for "section 202(f) of the Federal Railroad Safety Act of 1970".

1992—Par. (7). Pub. L. 102-365, which directed the addition of par. (7) at end, was executed by adding par. (7) after par. (6) and before concluding provisions, to reflect the probable intent of Congress.

1988—Par. (6). Pub. L. 100-430 added par. (6).

1986—Par. (3). Pub. L. 99-336 amended par. (3) generally. Prior to amendment, par. (3) read as follows: "such final orders of the Federal Maritime Commission or the Maritime Administration entered under chapters 23 and 23A of title 46 as are subject to judicial review under section 830 of title 46."

1984—Par. (5). Pub. L. 98-554 substituted "11901(j)(2)" for "11901(i)(2)".

1982—Pub. L. 97-164 inserted "(other than the United States Court of Appeals for the Federal Circuit)" after "court of appeals" in provisions preceding par. (1), and

## § 2343

## TITLE 28—JUDICIARY AND JUDICIAL PROCEDURE

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struck out par. (6) which had given the court of appeals jurisdiction in cases involving all final orders of the Merit Systems Protection Board except as provided for in section 7703(b) of title 5. See section 1295(a)(9) of this title.

1980—Par. (5). Pub. L. 96-454 inserted “and all final orders of such Commission made reviewable under section 11901(i)(2) of title 49, United States Code” after “section 2321 of this title”.

1978—Par. (6). Pub. L. 95-454 added par. (6).

1975—Par. (5). Pub. L. 93-584 added par. (5).

**EFFECTIVE DATE OF 1996 AMENDMENT**

Section 6(f) of Pub. L. 104-287 provided that the amendment made by that section is effective Dec. 29, 1995.

**EFFECTIVE DATE OF 1995 AMENDMENT**

Amendment by Pub. L. 104-88 effective Jan. 1, 1996, see section 2 of Pub. L. 104-88, set out as an Effective Date note under section 701 of Title 49, Transportation.

**EFFECTIVE DATE OF 1988 AMENDMENT**

Amendment by Pub. L. 100-430 effective on 180th day beginning after Sept. 13, 1988, see section 13(a) of Pub. L. 100-430, set out as a note under section 3601 of Title 42, The Public Health and Welfare.

**EFFECTIVE DATE OF 1986 AMENDMENT**

Section 5(b) of Pub. L. 99-336 provided that: “The amendment made by this section [amending this section] shall apply with respect to any rule, regulation, or final order described in such amendment which is issued on or after the date of the enactment of this Act [June 19, 1986].”

**EFFECTIVE DATE OF 1982 AMENDMENT**

Amendment by Pub. L. 97-164 effective Oct. 1, 1982, see section 402 of Pub. L. 97-164, set out as a note under section 171 of this title.

**EFFECTIVE DATE OF 1978 AMENDMENT**

Amendment by Pub. L. 95-454 effective 90 days after Oct. 13, 1978, see section 907 of Pub. L. 95-454, set out as a note under section 1101 of Title 5, Government Organization and Employees.

**EFFECTIVE DATE OF 1975 AMENDMENT**

Amendment by Pub. L. 93-584 not applicable to actions commenced on or before last day of first month beginning after Jan. 2, 1975, and actions to enjoin or suspend orders of Interstate Commerce Commission which are pending when this amendment becomes effective shall not be affected thereby, but shall proceed to final disposition under the law existing on the date they were commenced, see section 10 of Pub. L. 93-584, set out as a note under section 2321 of this title.

**TRANSFER OF FUNCTIONS**

Atomic Energy Commission abolished and functions transferred by sections 5814 and 5841 of Title 42, The Public Health and Welfare. See, also, Transfer of Functions notes set out under those sections.

**§ 2343. Venue**

The venue of a proceeding under this chapter is in the judicial circuit in which the petitioner resides or has its principal office, or in the United States Court of Appeals for the District of Columbia Circuit.

(Added Pub. L. 89-554, § 4(e), Sept. 6, 1966, 80 Stat. 622.)

**HISTORICAL AND REVISION NOTES**

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1033.	Dec. 29, 1950, ch. 1189, § 3. 64 Stat. 1130.

The section is reorganized for clarity and conciseness. The word “is” is substituted for “shall be”. The word “petitioner” is substituted for “party or any of the parties filing the petition for review” in view of the definition of “petitioner” in section 2341 of this title.

**§ 2344. Review of orders; time; notice; contents of petition; service**

On the entry of a final order reviewable under this chapter, the agency shall promptly give notice thereof by service or publication in accordance with its rules. Any party aggrieved by the final order may, within 60 days after its entry, file a petition to review the order in the court of appeals wherein venue lies. The action shall be against the United States. The petition shall contain a concise statement of—

- (1) the nature of the proceedings as to which review is sought;
- (2) the facts on which venue is based;
- (3) the grounds on which relief is sought; and
- (4) the relief prayed.

The petitioner shall attach to the petition, as exhibits, copies of the order, report, or decision of the agency. The clerk shall serve a true copy of the petition on the agency and on the Attorney General by registered mail, with request for a return receipt.

(Added Pub. L. 89-554, § 4(e), Sept. 6, 1966, 80 Stat. 622.)

**HISTORICAL AND REVISION NOTES**

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1034.	Dec. 29, 1950, ch. 1189, § 4. 64 Stat. 1130.

The section is reorganized, with minor changes in phraseology. The words “as prescribed by section 1033 of this title” are omitted as surplusage. The words “of the United States” following “Attorney General” are omitted as unnecessary.

**§ 2345. Prehearing conference**

The court of appeals may hold a prehearing conference or direct a judge of the court to hold a prehearing conference.

(Added Pub. L. 89-554, § 4(e), Sept. 6, 1966, 80 Stat. 622.)

**HISTORICAL AND REVISION NOTES**

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1035.	Dec. 29, 1950, ch. 1189, § 5. 64 Stat. 1130.

**§ 2346. Certification of record on review**

Unless the proceeding has been terminated on a motion to dismiss the petition, the agency shall file in the office of the clerk the record on review as provided by section 2112 of this title.

(Added Pub. L. 89-554, § 4(e), Sept. 6, 1966, 80 Stat. 623.)

**HISTORICAL AND REVISION NOTES**

Derivation	U.S. Code	Revised Statutes and Statutes at Large
.....	5 U.S.C. 1036.	Dec. 29, 1950, ch. 1189, § 6. 64 Stat. 1130.

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[73 STAT.]

50 Stat. 888.  
42 USC 1430.

42 USC 1410.

consolidated under a single contract with one or more low-rent projects being assisted under the United States Housing Act of 1937, and all income from any such project conveyed under this section may be commingled with funds of the project or projects with which it is consolidated and applied in accordance with the requirements of the consolidated contract and the provisions of section 10(c) of the said Act".

## DISPOSAL OF PROJECT

64 Stat. 70.

SEC. 808. Notwithstanding any other provision of law, the Housing and Home Finance Administrator may, whenever he deems it desirable, in the public interest, and in the fulfillment of the purposes of title VI of the Act of October 14, 1940, as amended (42 U.S.C. 1587), with respect to a housing project known as the Southmore Mutual Housing Corporation Project of South Bend, Indiana, consent to the modification, with respect to purchase price, repayment period, rate of interest, time of payment of any installment on principal or interest, security, or any other term, of any contract, sale, mortgage, or other agreement with respect to such project or any part thereof.

## REAL ESTATE LOANS BY NATIONAL BANKS

48 Stat. 1248.  
12 USC 1709.

SEC. 809. Section 203 of the National Housing Act is amended by adding at the end thereof the following new subsection:

"(j) Loans secured by mortgages insured under this section shall not be taken into account in determining the amount of real estate loans which a national bank may make in relation to its capital and surplus or its time and savings deposits."

Approved September 23, 1959.

## Public Law 86-373

## AN ACT

September 23, 1959  
[S. 2568]

To amend the Atomic Energy Act of 1954, as amended, with respect to cooperation with States.

Atomic Energy  
Act of 1954,  
amendments.  
68 Stat. 919.  
42 USC 2011  
note.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following section be added to the Atomic Energy Act of 1954, as amended:

"SEC. 274. COOPERATION WITH STATES.—

"a. It is the purpose of this section—

"(1) to recognize the interests of the States in the peaceful uses of atomic energy, and to clarify the respective responsibilities under this Act of the States and the Commission with respect to the regulation of byproduct, source, and special nuclear materials;

"(2) to recognize the need, and establish programs for, cooperation between the States and the Commission with respect to control of radiation hazards associated with use of such materials;

"(3) to promote an orderly regulatory pattern between the Commission and State governments with respect to nuclear development and use and regulation of byproduct, source, and special nuclear materials;

"(4) to establish procedures and criteria for discontinuance of certain of the Commission's regulatory responsibilities with respect to byproduct, source, and special nuclear materials, and the assumption thereof by the States;

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"(5) to provide for coordination of the development of radiation standards for the guidance of Federal agencies and cooperation with the States; and

"(6) to recognize that, as the States improve their capabilities to regulate effectively such materials, additional legislation may be desirable.

"b. Except as provided in subsection c., the Commission is authorized to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission under chapters 6, 7, and 8, and section 161 of this Act, with respect to any one or more of the following materials within the State—

Agreements with States.

42 U.S.C. 2071-2112, 2201.

"(1) byproduct materials;

"(2) source materials;

"(3) special nuclear materials in quantities not sufficient to form a critical mass.

During the duration of such an agreement it is recognized that the State shall have authority to regulate the materials covered by the agreement for the protection of the public health and safety from radiation hazards.

"c. No agreement entered into pursuant to subsection b. shall provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of—

"(1) the construction and operation of any production or utilization facility;

"(2) the export from or import into the United States of byproduct, source, or special nuclear material, or of any production or utilization facility;

"(3) the disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;

"(4) the disposal of such other byproduct, source, or special nuclear material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

Notwithstanding any agreement between the Commission and any State pursuant to subsection b., the Commission is authorized by rule, regulation, or order to require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license issued by the Commission.

"d. The Commission shall enter into an agreement under subsection b. of this section with any State if—

Conditions.

"(1) The Governor of that State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and

"(2) the Commission finds that the State program is compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.

"e. (1) Before any agreement under subsection b. is signed by the Commission, the terms of the proposed agreement and of proposed exemptions pursuant to subsection f. shall be published once each week

Publication in F. R.

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for four consecutive weeks in the Federal Register; and such opportunity for comment by interested persons on the proposed agreement and exemptions shall be allowed as the Commission determines by regulation or order to be appropriate.

Licensing re-  
quirements.  
Exemptions.

"(2) Each proposed agreement shall include the proposed effective date of such proposed agreement or exemptions. The agreement and exemptions shall be published in the Federal Register within thirty days after signature by the Commission and the Governor.

"f. The Commission is authorized and directed, by regulation or order, to grant such exemptions from the licensing requirements contained in chapters 6, 7, and 8, and from its regulations applicable to licensees as the Commission finds necessary or appropriate to carry out any agreement entered into pursuant to subsection b. of this section.

"g. The Commission is authorized and directed to cooperate with the States in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible.

Federal Radia-  
tion Council.

"h. There is hereby established a Federal Radiation Council, consisting of the Secretary of Health, Education, and Welfare, the Chairman of the Atomic Energy Commission, the Secretary of Defense, the Secretary of Commerce, the Secretary of Labor, or their designees, and such other members as shall be appointed by the President. The Council shall consult qualified scientists and experts in radiation matters, including the President of the National Academy of Sciences, the Chairman of the National Committee on Radiation Protection and Measurement, and qualified experts in the field of biology and medicine and in the field of health physics. The Special Assistant to the President for Science and Technology, or his designee, is authorized to attend meetings, participate in the deliberations of, and to advise the Council. The Chairman of the Council shall be designated by the President, from time to time, from among the members of the Council. The Council shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States. The Council shall also perform such other functions as the President may assign to it by Executive order.

Inspections.

"i. The Commission in carrying out its licensing and regulatory responsibilities under this Act is authorized to enter into agreements with any State, or group of States, to perform inspections or other functions on a cooperative basis as the Commission deems appropriate. The Commission is also authorized to provide training, with or without charge, to employees of, and such other assistance to, any State or political subdivision thereof or group of States as the Commission deems appropriate. Any such provision or assistance by the Commission shall take into account the additional expenses that may be incurred by a State as a consequence of the State's entering into an agreement with the Commission pursuant to subsection b.

Termination of  
agreement.

"j. The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State with which an agreement under subsection b. has become effective, or upon request of the Governor of such State, may terminate or suspend its agreement with the State and reassert the licensing and regulatory authority vested in it under this Act, if the Commission finds that such termination or suspension is required to protect the public health and safety.

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"k. Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.

"l. With respect to each application for Commission license authorizing an activity as to which the Commission's authority is continued pursuant to subsection c., the Commission shall give prompt notice to the State or States in which the activity will be conducted of the filing of the license application; and shall afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses, and advise the Commission as to the application, without requiring such representatives to take a position for or against the granting of the application.

Notice of filing.

"m. No agreement entered into under subsection b., and no exemption granted pursuant to subsection f., shall affect the authority of the Commission under subsection 161 b. or i. to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material. For purposes of subsection 161i., activities covered by exemptions granted pursuant to subsection f. shall be deemed to constitute activities authorized pursuant to this Act; and special nuclear material acquired by any person pursuant to such an exemption shall be deemed to have been acquired pursuant to section 53.

42 USC 2201.

"n. As used in this section, the term 'State' means any State, Territory, or possession of the United States, the Canal Zone, Puerto Rico, and the District of Columbia."

42 USC 2073.

Definition.

SEC. 2. Section 108 of the Atomic Energy Act of 1954 is amended by deleting the phrase "distributed under the provisions of subsection 53a.," from the second sentence.

42 USC 2138.

Approved September 23, 1959.

## Public Law 86-374

## AN ACT

To promote and preserve local management of savings and loan associations by protecting them against encroachment by holding companies.

September 23, 1959  
[H. R. 7244]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That title IV of the National Housing Act, as amended (12 U.S.C., sec. 1724 et seq.), is amended by adding at the end thereof the following new section:

Savings and loan  
holding com-  
panies.  
Regulation.  
48 Stat. 1255.

## "REGULATION OF HOLDING COMPANIES

"SEC. 408. (a) (1) As used in this section, the term 'company' means any corporation, business trust, association, or similar organization, but does not include the Federal Savings and Loan Insurance Corporation, any partnership, or any company the majority of the shares of which is owned by the United States or by any State.

Definitions.

"(2) As used in this section (except when used in subsection (f)), the term 'stock' means nonwithdrawable stock, underlying ownership stock other than mutual shares in a mutual institution, permanent stock, guaranty stock, or stock of a similar nature (as defined by the Federal Home Loan Bank Board by regulation) by whatever name called.

"(3) For the purposes of this section, a company shall be considered as having control of an institution or other organization if such company owns, controls, or holds with power to vote more than

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## TITLE 42—THE PUBLIC HEALTH AND WELFARE

§ 2021

## § 2017a-1. Omitted

## CODIFICATION

Section, Pub. L. 95-39, title III, § 304, June 3, 1977, 91 Stat. 189, which authorized the Administrator of the Energy Research and Development Administration to perform construction design services for any Administration construction project whenever the Administrator made certain determinations, was from an Act authorizing appropriations for fiscal year 1977 to the Energy Research and Development Administration, and was not enacted as part of the Atomic Energy Act of 1954 which comprises this chapter. See section 5821(g) of this title.

Similar provisions were contained in the following prior appropriation authorization acts:

Pub. L. 94-187, title III, § 301, Dec. 31, 1975, 89 Stat. 1073.  
 Pub. L. 93-276, title I, § 103, May 10, 1974, 88 Stat. 118.  
 Pub. L. 93-60, § 103, July 6, 1973, 87 Stat. 144.  
 Pub. L. 92-314, title I, § 103, June 16, 1972, 86 Stat. 225.  
 Pub. L. 92-84, title I, § 103, Aug. 11, 1971, 85 Stat. 306.  
 Pub. L. 91-273, § 103, June 2, 1970, 84 Stat. 300.  
 Pub. L. 91-44, § 103, July 11, 1969, 83 Stat. 47.  
 Pub. L. 90-289, § 103, Apr. 19, 1968, 82 Stat. 97.  
 Pub. L. 90-56, § 103, July 26, 1967, 81 Stat. 125.  
 Pub. L. 89-428, § 103, May 21, 1966, 80 Stat. 163.  
 Pub. L. 89-32, § 103, June 2, 1965, 79 Stat. 122.  
 Pub. L. 88-332, § 104, June 30, 1964, 78 Stat. 229.

## § 2017b. Omitted

## CODIFICATION

Section, act Sept. 26, 1962, Pub. L. 87-701, § 104, 76 Stat. 601, which authorized appropriations for the Atomic Energy Commission for restoration or replacement of facilities, was from an Act authorizing appropriations for the Atomic Energy Commission, and was not enacted as part of the Atomic Energy Act of 1954 which comprises this chapter. See section 2017(c) of this title.

Similar provisions were contained in the following prior appropriation authorization acts:

Sept. 26, 1961, Pub. L. 87-315, § 104, 75 Stat. 678.  
 May 13, 1960, Pub. L. 86-457, § 104, 74 Stat. 122.  
 June 23, 1959, Pub. L. 86-50, § 104, 73 Stat. 83.  
 Aug. 4, 1958, Pub. L. 85-590, 72 Stat. 493.  
 Aug. 21, 1957, Pub. L. 85-162, title I, § 104, 71 Stat. 406.  
 May 3, 1956, ch. 233, § 104, 70 Stat. 129.  
 July 11, 1955, ch. 304, § 104, 69 Stat. 293.

## § 2018. Agency jurisdiction

Nothing in this chapter shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to the generation, sale, or transmission of electric power produced through the use of nuclear facilities licensed by the Commission: *Provided*, That this section shall not be deemed to confer upon any Federal, State, or local agency any authority to regulate, control, or restrict any activities of the Commission.

(Aug. 1, 1946, ch. 724, title I, § 271, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 960; amended Pub. L. 89-135, Aug. 24, 1965, 79 Stat. 551; renumbered title I, Pub. L. 102-486, title IX, § 902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

## AMENDMENTS

1965—Pub. L. 89-135 inserted “produced through the use of nuclear facilities licensed by the Commission: *Provided*, That this section shall not be deemed to confer upon any Federal, State, or local agency any authority to regulate, control, or restrict any activities of the Commission.”

## § 2019. Applicability of Federal Power Act

Every licensee under this chapter who holds a license from the Commission for a utilization or

production facility for the generation of commercial electric energy under section 2133 of this title and who transmits such electric energy in interstate commerce or sells it at wholesale in interstate commerce shall be subject to the regulatory provisions of the Federal Power Act [16 U.S.C. 791a et seq.].

(Aug. 1, 1946, ch. 724, title I, § 272, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 960; renumbered title I, Pub. L. 102-486, title IX, § 902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

## REFERENCES IN TEXT

The Federal Power Act, referred to in text, is act June 10, 1920, ch. 285, 41 Stat. 1063, as amended, which is classified generally to chapter 12 (§ 791a et seq.) of Title 16, Conservation. For complete classification of this Act to the Code, see section 791a of Title 16 and Tables.

## § 2020. Licensing of Government agencies

Nothing in this chapter shall preclude any Government agency now or hereafter authorized by law to engage in the production, marketing, or distribution of electric energy from obtaining a license under section 2133 of this title, if qualified under the provisions of said section, for the construction and operation of production or utilization facilities for the primary purpose of producing electric energy for disposition for ultimate public consumption.

(Aug. 1, 1946, ch. 724, title I, § 273, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 960; renumbered title I, Pub. L. 102-486, title IX, § 902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

## § 2021. Cooperation with States

## (a) Purpose

It is the purpose of this section—

(1) to recognize the interests of the States in the peaceful uses of atomic energy, and to clarify the respective responsibilities under this chapter of the States and the Commission with respect to the regulation of byproduct, source, and special nuclear materials;

(2) to recognize the need, and establish programs for, cooperation between the States and the Commission with respect to control of radiation hazards associated with use of such materials;

(3) to promote an orderly regulatory pattern between the Commission and State governments with respect to nuclear development and use and regulation of byproduct, source, and special nuclear materials;

(4) to establish procedures and criteria for discontinuance of certain of the Commission's regulatory responsibilities with respect to byproduct, source, and special nuclear materials, and the assumption thereof by the States;

(5) to provide for coordination of the development of radiation standards for the guidance of Federal agencies and cooperation with the States; and

(6) to recognize that, as the States improve their capabilities to regulate effectively such materials, additional legislation may be desirable.

## (b) Agreements with States

Except as provided in subsection (c) of this section, the Commission is authorized to enter

into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission under subchapters V, VI, and VII of this division, and section 2201 of this title, with respect to any one or more of the following materials within the State:

- (1) Byproduct materials (as defined in section 2014(e) of this title).
- (2) Source materials.
- (3) Special nuclear materials in quantities not sufficient to form a critical mass.

During the duration of such an agreement it is recognized that the State shall have authority to regulate the materials covered by the agreement for the protection of the public health and safety from radiation hazards.

**(c) Commission regulation of certain activities**

No agreement entered into pursuant to subsection (b) of this section shall provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of—

- (1) the construction and operation of any production or utilization facility or any uranium enrichment facility;
- (2) the export from or import into the United States of byproduct, source, or special nuclear material, or of any production or utilization facility;
- (3) the disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;
- (4) the disposal of such other byproduct, source, or special nuclear material as the Commission determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

The Commission shall also retain authority under any such agreement to make a determination that all applicable standards and requirements have been met prior to termination of a license for byproduct material, as defined in section 2014(e)(2) of this title. Notwithstanding any agreement between the Commission and any State pursuant to subsection (b) of this section, the Commission is authorized by rule, regulation, or order to require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material shall not transfer possession or control of such product except pursuant to a license issued by the Commission.

**(d) Conditions**

The Commission shall enter into an agreement under subsection (b) of this section with any State if—

- (1) The Governor of that State certifies that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement, and that the State desires to assume regulatory responsibility for such materials; and
- (2) the Commission finds that the State program is in accordance with the requirements

of subsection (c) of this section and in all other respects compatible with the Commission's program for the regulation of such materials, and that the State program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement.

**(e) Publication in Federal Register; comment of interested persons**

(1) Before any agreement under subsection (b) of this section is signed by the Commission, the terms of the proposed agreement and of proposed exemptions pursuant to subsection (f) of this section shall be published once each week for four consecutive weeks in the Federal Register; and such opportunity for comment by interested persons on the proposed agreement and exemptions shall be allowed as the Commission determines by regulation or order to be appropriate.

(2) Each proposed agreement shall include the proposed effective date of such proposed agreement or exemptions. The agreement and exemptions shall be published in the Federal Register within thirty days after signature by the Commission and the Governor.

**(f) Exemptions**

The Commission is authorized and directed, by regulation or order, to grant such exemptions from the licensing requirements contained in subchapters V, VI, and VII of this division, and from its regulations applicable to licensees as the Commission finds necessary or appropriate to carry out any agreement entered into pursuant to subsection (b) of this section.

**(g) Compatible radiation standards**

The Commission is authorized and directed to cooperate with the States in the formulation of standards for protection against hazards of radiation to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible.

**(h) Consultative, advisory, and miscellaneous functions of Administrator of Environmental Protection Agency**

The Administrator of the Environmental Protection Agency shall consult qualified scientists and experts in radiation matters, including the President of the National Academy of Sciences, the Chairman of the National Committee on Radiation Protection and Measurement, and qualified experts in the field of biology and medicine and in the field of health physics. The Special Assistant to the President for Science and Technology, or his designee, is authorized to attend meetings with, participate in the deliberations of, and to advise the Administrator. The Administrator shall advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all Federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with States. The Administrator shall also perform such other functions as the President may assign to him by Executive order.

**(i) Inspections and other functions; training and other assistance**

The Commission in carrying out its licensing and regulatory responsibilities under this chapter is authorized to enter into agreements with any State, or group of States, to perform inspections or other functions on a cooperative basis as the Commission deems appropriate. The Commission is also authorized to provide training, with or without charge, to employees of, and such other assistance to, any State or political subdivision thereof or group of States as the Commission deems appropriate. Any such provision or assistance by the Commission shall take into account the additional expenses that may be incurred by a State as a consequence of the State's entering into an agreement with the Commission pursuant to subsection (b) of this section.

**(j) Reserve power to terminate or suspend agreements; emergency situations; State nonaction on causes of danger; authority exercisable only during emergency and commensurate with danger**

(1) The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State with which an agreement under subsection (b) of this section has become effective, or upon request of the Governor of such State, may terminate or suspend all or part of its agreement with the State and reassert the licensing and regulatory authority vested in it under this chapter, if the Commission finds that (1) such termination or suspension is required to protect the public health and safety, or (2) the State has not complied with one or more of the requirements of this section. The Commission shall periodically review such agreements and actions taken by the States under the agreements to ensure compliance with the provisions of this section.

(2) The Commission, upon its own motion or upon request of the Governor of any State, may, after notifying the Governor, temporarily suspend all or part of its agreement with the State without notice or hearing if, in the judgment of the Commission:

(A) an emergency situation exists with respect to any material covered by such an agreement creating danger which requires immediate action to protect the health or safety of persons either within or outside the State, and

(B) the State has failed to take steps necessary to contain or eliminate the cause of the danger within a reasonable time after the situation arose.

A temporary suspension under this paragraph shall remain in effect only for such time as the emergency situation exists and shall authorize the Commission to exercise its authority only to the extent necessary to contain or eliminate the danger.

**(k) State regulation of activities for certain purposes**

Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.

**(l) Commission regulated activities; notice of filing; hearing**

With respect to each application for Commission license authorizing an activity as to which the Commission's authority is continued pursuant to subsection (c) of this section, the Commission shall give prompt notice to the State or States in which the activity will be conducted of the filing of the license application; and shall afford reasonable opportunity for State representatives to offer evidence, interrogate witnesses, and advise the Commission as to the application without requiring such representatives to take a position for or against the granting of the application.

**(m) Limitation of agreements and exemptions**

No agreement entered into under subsection (b) of this section, and no exemption granted pursuant to subsection (f) of this section, shall affect the authority of the Commission under section 2201(b) or (i) of this title to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material. For purposes of section 2201(i) of this title, activities covered by exemptions granted pursuant to subsection (f) of this section shall be deemed to constitute activities authorized pursuant to this chapter; and special nuclear material acquired by any person pursuant to such an exemption shall be deemed to have been acquired pursuant to section 2073 of this title.

**(n) "State" and "agreement" defined**

As used in this section, the term "State" means any State, Territory, or possession of the United States, the Canal Zone, Puerto Rico, and the District of Columbia. As used in this section, the term "agreement" includes any amendment to any agreement.

**(o) State compliance requirements: compliance with section 2113(b) of this title and health and environmental protection standards; procedures for licenses, rulemaking, and license impact analysis; amendment of agreements for transfer of State collected funds; proceedings duplication restriction; alternative requirements**

In the licensing and regulation of byproduct material, as defined in section 2014(e)(2) of this title, or of any activity which results in the production of byproduct material as so defined under an agreement entered into pursuant to subsection (b) of this section, a State shall require—

(1) compliance with the requirements of subsection (b) of section 2113 of this title (respecting ownership of byproduct material and land), and

(2) compliance with standards which shall be adopted by the State for the protection of the public health, safety, and the environment from hazards associated with such material which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission for the same purpose, including requirements and standards promulgated by the Commission and the Administrator of the Environmental Pro-

tection Agency pursuant to sections 2113, 2114, and 2022 of this title, and

(3) procedures which—

(A) in the case of licenses, provide procedures under State law which include—

(i) an opportunity, after public notice, for written comments and a public hearing, with a transcript,

(ii) an opportunity for cross examination, and

(iii) a written determination which is based upon findings included in such determination and upon the evidence presented during the public comment period and which is subject to judicial review;

(B) in the case of rulemaking, provide an opportunity for public participation through written comments or a public hearing and provide for judicial review of the rule;

(C) require for each license which has a significant impact on the human environment a written analysis (which shall be available to the public before the commencement of any such proceedings) of the impact of such license, including any activities conducted pursuant thereto, on the environment, which analysis shall include—

(i) an assessment of the radiological and nonradiological impacts to the public health of the activities to be conducted pursuant to such license;

(ii) an assessment of any impact on any waterway and groundwater resulting from such activities;

(iii) consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to such license; and

(iv) consideration of the long-term impacts, including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to such license, including the management of any byproduct material, as defined by section 2014(e)(2) of this title; and

(D) prohibit any major construction activity with respect to such material prior to complying with the provisions of subparagraph (C).

If any State under such agreement imposes upon any licensee any requirement for the payment of funds to such State for the reclamation or long-term maintenance and monitoring of such material, and if transfer to the United States of such material is required in accordance with section 2113(b) of this title, such agreement shall be amended by the Commission to provide that such State shall transfer to the United States upon termination of the license issued to such licensee the total amount collected by such State from such licensee for such purpose. If such payments are required, they must be sufficient to ensure compliance with the standards established by the Commission pursuant to section 2201(x) of this title. No State shall be required under paragraph (3) to conduct proceedings concerning any license or regulation which would duplicate proceedings conducted by the Commission. In adopting requirements pursuant

to paragraph (2) of this subsection with respect to sites at which ores are processed primarily for their source material content or which are used for the disposal of byproduct material as defined in section 2014(e)(2) of this title, the State may adopt alternatives (including, where appropriate, site-specific alternatives) to the requirements adopted and enforced by the Commission for the same purpose if, after notice and opportunity for public hearing, the Commission determines that such alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with such sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by standards and requirements adopted and enforced by the Commission for the same purpose and any final standards promulgated by the Administrator of the Environmental Protection Agency in accordance with section 2022 of this title. Such alternative State requirements may take into account local or regional conditions, including geology, topography, hydrology and meteorology.

(Aug. 1, 1946, ch. 724, title I, § 274, as added Pub. L. 86-373, § 1, Sept. 23, 1959, 73 Stat. 688; amended 1970 Reorg. Plan No. 3, §§ 2(a)(7), 6(2), eff. Dec. 2, 1970, 35 F.R. 15623, 84 Stat. 2086; Pub. L. 95-604, title II, § 204(a)-(e)(1), (f), Nov. 8, 1978, 92 Stat. 3036-3038; Pub. L. 96-295, title II, § 205, June 30, 1980, 94 Stat. 787; Pub. L. 97-415, § 19(a), Jan. 4, 1983, 96 Stat. 2078; renumbered title I and amended Pub. L. 102-486, title IX, § 902(a)(6), (8), Oct. 24, 1992, 106 Stat. 2944; Pub. L. 109-58, title VI, § 651(e)(2), Aug. 8, 2005, 119 Stat. 807.)

#### REFERENCES IN TEXT

For definition of Canal Zone, referred to in subsec. (n), see section 3602(b) of Title 22, Foreign Relations and Intercourse.

#### CODIFICATION

In subsec. (h) of this section, provisions for the establishment of a Federal Radiation Council and for the designation of its Chairman and members have been omitted and the Administrator of the Environmental Protection Agency has been substituted for the Council as the person charged with the responsibility of carrying out the functions of the Council pursuant to Reorg. Plan No. 3 of 1970, §§ 2(a)(7), 6(2), eff. Dec. 2, 1970, 35 F.R. 15623, 84 Stat. 2086, set out in the Appendix to Title 5, Government Organization and Employees, which abolished the Federal Radiation Council and transferred its functions to the Administrator of the Environmental Protection Administration.

#### AMENDMENTS

2005—Subsec. (b). Pub. L. 109-58 substituted "State:" for "State—" in introductory provisions, added pars. (1) to (3), and struck out former pars. (1) to (4) which read as follows:

"(1) byproduct materials as defined in section 2014(e)(1) of this title;

"(2) byproduct materials as defined in section 2014(e)(2) of this title;

"(3) source materials;

"(4) special nuclear materials in quantities not sufficient to form a critical mass."

1992—Subsec. (c)(1). Pub. L. 102-486, § 902(a)(6), inserted before semicolon at end "or any uranium enrichment facility".

1983—Subsec. (o). Pub. L. 97-415 inserted provisions relating to the adoption of equivalent alternative requirements by the States.

1980—Subsec. (j). Pub. L. 96-295 designated existing provisions as par. (1) and added par. (2).

1978—Subsec. (b). Pub. L. 95-604, §204(a), inserted in par. (1) "as defined in section 2014(e)(1) of this title" after "byproduct materials", added par. (2), and redesignated former pars. (2) and (3) as (3) and (4), respectively.

Subsec. (c). Pub. L. 95-604, §204(f), required the Commission to retain authority under the agreement to make a determination that all applicable standards and requirements have been met prior to termination of a license for byproduct material as defined in section 2014(e)(2) of this title.

Subsec. (d)(2). Pub. L. 95-604, §204(b), inserted "in accordance with the requirements of subsection (o) of this section and in all other respects" before "compatible".

Subsec. (j). Pub. L. 95-604, §204(d), inserted "all or part of" after "suspend", designated provision requiring termination or suspension be necessary to protect the public health and safety as cl. (1), added cl. (2), and inserted provision requiring the Commission to periodically review the agreements and actions taken by the States under the agreements to ensure compliance with the provisions of this section.

Subsec. (n). Pub. L. 95-604, §204(c), inserted definition of "agreement".

Subsec. (o). Pub. L. 95-604, §204(e)(1), added subsec. (o).

#### EFFECTIVE DATE OF 1978 AMENDMENT

Section 204(e)(2) of Pub. L. 95-604, as added by Pub. L. 96-106, §22(d), Nov. 9, 1979, 93 Stat. 800, provided that: "The provisions of the amendment made by paragraph (1) of this subsection (which adds a new subsection o. to section 274 of the Atomic Energy Act of 1954 [this section]) shall apply only to the maximum extent practicable during the three-year period beginning on the date of the enactment of this Act [Nov. 8, 1978]."

Amendment by Pub. L. 95-604 effective Nov. 8, 1978, see section 208 of Pub. L. 95-604, set out as a note under section 2014 of this title.

#### STATE AUTHORITIES AND AGREEMENTS RESPECTING BY-PRODUCT MATERIAL; ENTRY AND EFFECTIVE DATES OF AGREEMENTS

Section 204(g), (h) of Pub. L. 95-604, as amended by Pub. L. 96-106, §22(a), (b), Nov. 9, 1979, 93 Stat. 799; Pub. L. 97-415, §19(b), Jan. 4, 1983, 96 Stat. 2079, provided that:

"(g) Nothing in any amendment made by this section [amending this section] shall preclude any State from exercising any other authority as permitted under the Atomic Energy Act of 1954 [this chapter] respecting any byproduct material, as defined in section 11 e. (2) of the Atomic Energy Act of 1954 [section 2014(e)(2) of this title].

"(h)(1) During the three-year period beginning on the date of the enactment of this Act [Nov. 8, 1978], notwithstanding any other provision of this title [See Effective Date of 1978 Amendment note set out under section 2014 of this title], any State may exercise any authority under State law (including authority exercised pursuant to an agreement entered into pursuant to section 274 of the Atomic Energy Act of 1954 [this section]) respecting (A) byproduct material, as defined in section 11 e. (2) of the Atomic Energy Act of 1954 [section 2014(e)(2) of this title], or (B) any activity which results in the production of byproduct material as so defined, in the same manner and to the same extent as permitted before the date of the enactment of this Act, except that such State authority shall be exercised in a manner which, to the extent practicable, is consistent with the requirements of section 274 o. of the Atomic Energy Act of 1954 (as added by section 204(e) of this Act) [subsec. (o) of this section]. The Commission shall have the authority to ensure that such section 274 o. is implemented by any such State to the extent practicable during the three-year period beginning on the date of the enactment of this Act. Nothing in this sec-

tion shall be construed to preclude the Commission or the Administrator of the Environmental Protection Agency from taking such action under section 275 of the Atomic Energy Act of 1954 [section 2022 of this title] as may be necessary to implement title I of this Act [section 7911 et seq. of this title].

"(2) An agreement entered into with any State as permitted under section 274 of the Atomic Energy Act of 1954 [this section] with respect to byproduct material as defined in section 11 e. (2) of such Act. [section 2014(e)(2) of this title], may be entered into at any time after the date of the enactment of this Act [Nov. 8, 1978] but no such agreement may take effect before the date three years after the date of the enactment of this Act.

"(3) Notwithstanding any other provision of this title [See Effective Date of 1978 Amendment note set out under section 2014 of this title], where a State assumes or has assumed, pursuant to an agreement entered into under section 274 b. of the Atomic Energy Act of 1954 [subsec. (b) of this section], authority over any activity which results in the production of byproduct material, as defined in section 11 e. (2) of such Act [section 2014(e)(2) of this title], the Commission shall not, until the end of the three-year period beginning on the date of the enactment of this Act [Nov. 8, 1978], have licensing authority over such byproduct material produced in any activity covered by such agreement, unless the agreement is terminated, suspended, or amended to provide for such Federal licensing. If, at the end of such three-year period, a State has not entered into such an agreement with respect to byproduct material, as defined in section 11 e. (2) of the Atomic Energy Act of 1954, the Commission shall have authority over such byproduct material: *Provided, however*, That, in the case of a State which has exercised any authority under State law pursuant to an agreement entered into under section 274 of the Atomic Energy Act of 1954 [this section], the State authority over such byproduct material may be terminated, and the Commission authority over such material may be exercised, only after compliance by the Commission with the same procedures as are applicable in the case of termination of agreements under section 274j. of the Atomic Energy Act of 1954 [subsec. (j) of this section]."

#### FEDERAL COMPLIANCE WITH POLLUTION CONTROL STANDARDS

For provisions relating to the responsibility of the head of each Executive agency for compliance with applicable pollution control standards, see Ex. Ord. No. 12088, Oct. 13, 1978, 43 F.R. 47707, set out as a note under section 4321 of this title.

#### EXECUTIVE ORDER NO. 12192

Ex. Ord. No. 12192, Feb. 12, 1980, 45 F.R. 9727, which established the State Planning Council on Radioactive Waste Management and provided for its membership, functions, etc., was revoked by Ex. Ord. No. 12379, §13, Aug. 17, 1982, 47 F.R. 36099, set out as a note under section 14 of the Federal Advisory Committee Act in the Appendix to Title 5, Government Organization and Employees.

#### § 2021a. Storage or disposal facility planning

(a) Any person, agency, or other entity proposing to develop a storage or disposal facility, including a test disposal facility, for high-level radioactive wastes, non-high-level radioactive wastes including transuranium contaminated wastes, or irradiated nuclear reactor fuel, shall notify the Commission as early as possible after the commencement of planning for a particular proposed facility. The Commission shall in turn notify the Governor and the State legislature of the State of proposed situs whenever the Commission has knowledge of such proposal.

(b) The Commission is authorized and directed to prepare a report on means for improving the

## § 2237

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5 and chapter 7 of title 5. Just compensation shall be paid for the use of the facility.

(Aug. 1, 1946, ch. 724, title I, § 186, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 955; renumbered title I, Pub. L. 102-486, title IX, § 902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

## CODIFICATION

In subsecs. (b) and (c), "section 558(c) of title 5" and "subchapter II of chapter 5 and chapter 7 of title 5" substituted for "section 9(b) of the Administrative Procedure Act [5 U.S.C. 1008(b)]" and "the Administration Procedure Act [5 U.S.C. 1001-1011]", respectively, on authority of Pub. L. 89-554, § 7(b), Sept. 6, 1966, 80 Stat. 631, the first section of which enacted Title 5, Government Organization and Employees.

## § 2237. Modification of license

The terms and conditions of all licenses shall be subject to amendment, revision, or modification, by reason of amendments of this chapter or by reason of rules and regulations issued in accordance with the terms of this chapter.

(Aug. 1, 1946, ch. 724, title I, § 187, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 955; renumbered title I, Pub. L. 102-486, title IX, § 902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

## § 2238. Continued operation of facilities

Whenever the Commission finds that the public convenience and necessity or the production program of the Commission requires continued operation of a production facility or utilization facility the license for which has been revoked pursuant to section 2236 of this title, the Commission may, after consultation with the appropriate regulatory agency, State or Federal, having jurisdiction, order that possession be taken of and such facility be operated for such period of time as the public convenience and necessity or the production program of the Commission may, in the judgment of the Commission, require, or until a license for the operation of the facility shall become effective. Just compensation shall be paid for the use of the facility.

(Aug. 1, 1946, ch. 724, title I, § 188, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 955; renumbered title I, Pub. L. 102-486, title IX, § 902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

## § 2239. Hearings and judicial review

(a)(1)(A) In any proceeding under this chapter, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award or royalties under sections<sup>1</sup> 2183, 2187, 2236(c) or 2238 of this title, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. The Commission shall hold a hearing after thirty days' notice and publication once in the Federal Register, on each application under section 2133

or 2134(b) of this title for a construction permit for a facility, and on any application under section 2134(c) of this title for a construction permit for a testing facility. In cases where such a construction permit has been issued following the holding of such a hearing, the Commission may, in the absence of a request therefor by any person whose interest may be affected, issue an operating license or an amendment to a construction permit or an amendment to an operating license without a hearing, but upon thirty days' notice and publication once in the Federal Register of its intent to do so. The Commission may dispense with such thirty days' notice and publication with respect to any application for an amendment to a construction permit or an amendment to an operating license upon a determination by the Commission that the amendment involves no significant hazards consideration.

(B)(i) Not less than 180 days before the date scheduled for initial loading of fuel into a plant by a licensee that has been issued a combined construction permit and operating license under section 2235(b) of this title, the Commission shall publish in the Federal Register notice of intended operation. That notice shall provide that any person whose interest may be affected by operation of the plant, may within 60 days request the Commission to hold a hearing on whether the facility as constructed complies, or on completion will comply, with the acceptance criteria of the license.

(ii) A request for hearing under clause (i) shall show, prima facie, that one or more of the acceptance criteria in the combined license have not been, or will not be met, and the specific operational consequences of nonconformance that would be contrary to providing reasonable assurance of adequate protection of the public health and safety.

(iii) After receiving a request for a hearing under clause (i), the Commission expeditiously shall either deny or grant the request. If the request is granted, the Commission shall determine, after considering petitioners' prima facie showing and any answers thereto, whether during a period of interim operation, there will be reasonable assurance of adequate protection of the public health and safety. If the Commission determines that there is such reasonable assurance, it shall allow operation during an interim period under the combined license.

(iv) The Commission, in its discretion, shall determine appropriate hearing procedures, whether informal or formal adjudicatory, for any hearing under clause (i), and shall state its reasons therefor.

(v) The Commission shall, to the maximum possible extent, render a decision on issues raised by the hearing request within 180 days of the publication of the notice provided by clause (i) or the anticipated date for initial loading of fuel into the reactor, whichever is later. Commencement of operation under a combined license is not subject to subparagraph (A).

(2)(A) The Commission may issue and make immediately effective any amendment to an operating license or any amendment to a combined construction and operating license, upon a determination by the Commission that such

<sup>1</sup>So in original. Probably should be "section".

amendment involves no significant hazards consideration, notwithstanding the pendency before the Commission of a request for a hearing from any person. Such amendment may be issued and made immediately effective in advance of the holding and completion of any required hearing. In determining under this section whether such amendment involves no significant hazards consideration, the Commission shall consult with the State in which the facility involved is located. In all other respects such amendment shall meet the requirements of this chapter.

(B) The Commission shall periodically (but not less frequently than once every thirty days) publish notice of any amendments issued, or proposed to be issued, as provided in subparagraph (A). Each such notice shall include all amendments issued, or proposed to be issued, since the date of publication of the last such periodic notice. Such notice shall, with respect to each amendment or proposed amendment (i) identify the facility involved; and (ii) provide a brief description of such amendment. Nothing in this subsection shall be construed to delay the effective date of any amendment.

(C) The Commission shall, during the ninety-day period following the effective date of this paragraph, promulgate regulations establishing (i) standards for determining whether any amendment to an operating license or any amendment to a combined construction and operating license involves no significant hazards consideration; (ii) criteria for providing or, in emergency situations, dispensing with prior notice and reasonable opportunity for public comment on any such determination, which criteria shall take into account the exigency of the need for the amendment involved; and (iii) procedures for consultation on any such determination with the State in which the facility involved is located.

(b) The following Commission actions shall be subject to judicial review in the manner prescribed in chapter 158 of title 28 and chapter 7 of title 5:

(1) Any final order entered in any proceeding of the kind specified in subsection (a) of this section.

(2) Any final order allowing or prohibiting a facility to begin operating under a combined construction and operating license.

(3) Any final order establishing by regulation standards to govern the Department of Energy's gaseous diffusion uranium enrichment plants, including any such facilities leased to a corporation established under the USEC Privatization Act [42 U.S.C. 2297h et seq.].

(4) Any final determination under section 2297f(c) of this title relating to whether the gaseous diffusion plants, including any such facilities leased to a corporation established under the USEC Privatization Act [42 U.S.C. 2297h et seq.], are in compliance with the Commission's standards governing the gaseous diffusion plants and all applicable laws.

(Aug. 1, 1946, ch. 724, title I, § 189, as added Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 955; amended Pub. L. 85-256, § 7, Sept. 2, 1957, 71 Stat. 579; Pub. L. 87-615, § 2, Aug. 29, 1962, 76 Stat. 409; Pub. L. 97-415, § 12(a), Jan. 4, 1983, 96 Stat. 2073; renun-

bered title I and amended Pub. L. 102-486, title IX, § 902(a)(8), title XXVIII, §§ 2802, 2804, 2805, Oct. 24, 1992, 106 Stat. 2944, 3120, 3121; Pub. L. 104-134, title III, § 3116(c), Apr. 26, 1996, 110 Stat. 1321-349.)

#### REFERENCES IN TEXT

The effective date of this paragraph, referred to in subsec. (a)(2)(C), probably means the date of enactment of Pub. L. 97-415, which was approved Jan. 4, 1983.

The USEC Privatization Act, referred to in subsec. (b)(3), (4), is subchapter A (§§ 3101-3117) of chapter 1 of title III of Pub. L. 104-134, Apr. 26, 1996, 110 Stat. 1321-335, which is classified principally to subchapter VIII (§ 2297h et seq.) of this chapter. For complete classification of this Act to the Code, see Short Title of 1996 Amendment note set out under section 2011 of this title and Tables.

#### AMENDMENTS

1996—Subsec. (b). Pub. L. 104-134 amended subsec. (b) generally. Prior to amendment, subsec. (b) read as follows: "Any final order entered in any proceeding of the kind specified in subsection (a) of this section or any final order allowing or prohibiting a facility to begin operating under a combined construction and operating license shall be subject to judicial review in the manner prescribed in the Act of December 29, 1950, as amended (ch. 1189, 64 Stat. 1129), and to the provisions of section 10 of the Administrative Procedure Act, as amended."

1992—Subsec. (a)(1). Pub. L. 102-486, § 2802, designated existing provisions as subpar. (A) and added subpar. (B).

Subsec. (a)(2)(A), (C). Pub. L. 102-486, § 2804, inserted "or any amendment to a combined construction and operating license" after "any amendment to an operating license".

Subsec. (b). Pub. L. 102-486, § 2805, inserted "or any final order allowing or prohibiting a facility to begin operating under a combined construction and operating license" before "shall be subject to judicial review".

1983—Subsec. (a). Pub. L. 97-415 designated existing provisions as par. (1) and added par. (2).

1962—Subsec. (a). Pub. L. 87-615 substituted "construction permit for a facility" and "construction permit for a testing facility" for "license for a facility" and "license for a testing facility" respectively, and authorized the commission in cases where a permit has been issued following a hearing, and in the absence of a request therefor by anyone whose interest may be affected, to issue an operating license or an amendment to a construction permit or an operating license without a hearing upon thirty days' notice and publication once in the Federal Register of its intent to do so, and to dispense with such notice and publication with respect to any application for an amendment to a construction permit or to an operating license upon its determination that the amendment involves no significant hazards consideration.

1957—Subsec. (a). Pub. L. 85-256 required the Commission to hold a hearing after 30 days notice and publication once in the Federal Register on an application for a license for a facility or a testing facility.

#### EFFECTIVE DATE OF 1992 AMENDMENT

Subsec. (a)(1)(B) of this section, as added by section 2802 of Pub. L. 102-486, applicable to all proceedings involving combined license for which application was filed after May 8, 1991, see section 2806 of Pub. L. 102-486, set out as a note under section 2235 of this title.

#### AUTHORITY TO EFFECTUATE AMENDMENTS TO OPERATING LICENSES

Section 12(b) of Pub. L. 97-415 provided that: "The authority of the Nuclear Regulatory Commission, under the provisions of the amendment made by subsection (a) [amending this section], to issue and to make immediately effective any amendment to an operating license shall take effect upon the promulgation by the

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Commission of the regulations required in such provisions."

REVIEW OF NUCLEAR PROLIFERATION ASSESSMENT STATEMENTS

No court or regulatory body to have jurisdiction to compel performance of or to review adequacy of performance of any Nuclear Proliferation Assessment Statement called for by the Atomic Energy Act of 1954 [this chapter] or by the Nuclear Non-Proliferation Act of 1978, Pub. L. 95-242, Mar. 10, 1978, 92 Stat. 120, see section 2160a of this title.

ADMINISTRATIVE ORDERS REVIEW ACT

Court of appeals exclusive jurisdiction respecting final orders of Atomic Energy Commission, now the Nuclear Regulatory Commission and the Secretary of Energy, made reviewable by this section, see section 2342 of Title 28, Judiciary and Judicial Procedure.

§ 2240. Licensee incident reports as evidence

No report by any licensee of any incident arising out of or in connection with a licensed activity made pursuant to any requirement of the Commission shall be admitted as evidence in any suit or action for damages growing out of any matter mentioned in such report.

(Aug. 1, 1946, ch. 724, title I, §190, as added Pub. L. 87-206, §16, Sept. 6, 1961, 75 Stat. 479; renumbered title I, Pub. L. 102-486, title IX, §902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

§ 2241. Atomic safety and licensing boards; establishment; membership; functions; compensation

(a) Notwithstanding the provisions of sections 556(b) and 557(b) of title 5, the Commission is authorized to establish one or more atomic safety and licensing boards, each comprised of three members, one of whom shall be qualified in the conduct of administrative proceedings and two of whom shall have such technical or other qualifications as the Commission deems appropriate to the issues to be decided, to conduct such hearings as the Commission may direct and make such intermediate or final decisions as the Commission may authorize with respect to the granting, suspending, revoking or amending of any license or authorization under the provisions of this chapter, any other provision of law, or any regulation of the Commission issued thereunder. The Commission may delegate to a board such other regulatory functions as the Commission deems appropriate. The Commission may appoint a panel of qualified persons from which board members may be selected.

(b) Board members may be appointed by the Commission from private life, or designated from the staff of the Commission or other Federal agency. Board members appointed from private life shall receive a per diem compensation for each day spent in meetings or conferences, and all members shall receive their necessary traveling or other expenses while engaged in the work of a board. The provisions of section 2203 of this title shall be applicable to board members appointed from private life.

(Aug. 1, 1946, ch. 724, title I, §191, as added Pub. L. 87-615, §1, Aug. 29, 1962, 76 Stat. 409; amended Pub. L. 91-560, §10, Dec. 19, 1970, 84 Stat. 1474; renumbered title I, Pub. L. 102-486, title IX, §902(a)(8), Oct. 24, 1992, 106 Stat. 2944.)

CODIFICATION

In subsec. (a), "sections 556(b) and 557(b) of title 5" substituted for "sections 7(a) and 8(a) of the Administrative Procedure Act [5 U.S.C. 1006(a), 1007(a)]" on authority of Pub. L. 89-554, §7(b), Sept. 6, 1966, 80 Stat. 631, the first section of which enacted Title 5, Government Organization and Employees.

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1970—Subsec. (a). Pub. L. 91-560 required that two members of the board should have such technical or other qualifications the Commission deems appropriate to the issues to be decided.

§ 2242. Temporary operating license

(a) Fuel loading, testing, and operation at specific power level; petition, affidavit, etc.

In any proceeding upon an application for an operating license for a utilization facility required to be licensed under section 2133 or 2134(b) of this title, in which a hearing is otherwise required pursuant to section 2239(a) of this title, the applicant may petition the Commission for a temporary operating license for such facility authorizing fuel loading, testing, and operation at a specific power level to be determined by the Commission, pending final action by the Commission on the application. The initial petition for a temporary operating license for each such facility, and any temporary operating license issued for such facility based upon the initial petition, shall be limited to power levels not to exceed 5 percent of rated full thermal power. Following issuance by the Commission of the temporary operating license for each such facility, the licensee may file petitions with the Commission to amend the license to allow facility operation in staged increases at specific power levels, to be determined by the Commission, exceeding 5 percent of rated full thermal power. The initial petition for a temporary operating license for each such facility may be filed at any time after the filing of: (1) the report of the Advisory Committee on Reactor Safeguards required by section 2232(b) of this title; (2) the filing of the initial Safety Evaluation Report by the Nuclear Regulatory Commission staff and the Nuclear Regulatory Commission staff's first supplement to the report prepared in response to the report of the Advisory Committee on Reactor Safeguards for the facility; (3) the Nuclear Regulatory Commission staff's final detailed statement on the environmental impact of the facility prepared pursuant to section 4332(2)(C) of this title; and (4) a State, local, or utility emergency preparedness plan for the facility. Petitions for the issuance of a temporary operating license, or for an amendment to such a license allowing operation at a specific power level greater than that authorized in the initial temporary operating license, shall be accompanied by an affidavit or affidavits setting forth the specific facts upon which the petitioner relies to justify issuance of the temporary operating license or the amendment thereto. The Commission shall publish notice of each such petition in the Federal Register and in such trade or news publications as the Commission deems appropriate to give reasonable notice to persons who might have a potential interest in the grant of such temporary operating

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coverage for damage in Canada and Mexico and, at another point, noted the Committee's hope that the insurance contract in its final form would cover the same scope as the bill.<sup>10</sup>

(1) It is my opinion that since the language of the Act draws no distinction between damage received in the United States and that received abroad, none can properly be drawn. To read the Act as imposing such a limitation in the absence of statutory direction and in the light of an avowed Congressional intention to encourage the development of the atomic energy industry would be unwarranted. The confusing sentence cited in the Report must, therefore, be read consistently with the language of the Act in the manner suggested above, i.e., as recognizing Congressional inability to limit foreign liability, or must be ignored as inconsistent with the broad coverage of the statutory language.

[25 FR 4075, May 7, 1960]

**§8.3 [Reserved]****§8.4 Interpretation by the General Counsel: AEC jurisdiction over nuclear facilities and materials under the Atomic Energy Act.**

(a) By virtue of the Atomic Energy Act of 1954, as amended,<sup>11</sup> the individual States may not, in the absence of an agreement with the Atomic Energy Commission, regulate the materials described in the Act from the standpoint of radiological health and safety. Even States which have entered into agreements with the AEC lack authority to regulate the facilities described in the Act, including nuclear power plants and the discharge of effluents from such facilities, from the standpoint of radiological health and safety.

(b) The Atomic Energy Act of 1954 sets out a pattern for licensing and regulation of certain nuclear materials and facilities on the basis of the common defense and security and radiological health and safety. The regulatory pattern requires, in general, that the construction and operation of production facilities (nuclear reactors

<sup>10</sup> Report, p. 11.

<sup>11</sup> Pub. L. 83-703, 68 Stat. 919.

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used for production and separation of plutonium or uranium-233 or fuel reprocessing plants) and utilization facilities (nuclear reactors used for production of power, medical therapy, research, and testing) and the possession and use of byproduct material (radioisotopes), source material (thorium and uranium ores), and special nuclear material (enriched uranium and plutonium, used as fuel in nuclear reactors), be licensed and regulated by the Commission.<sup>12</sup> In carrying out its statutory responsibilities for the protection of the public health and safety from radiation hazards and for the promotion of the common defense and security, the AEC has promulgated regulations which establish requirements for the issuance of licenses (Parts 30-36, 40, 50, 70, 71, and 100 of this chapter) and specify standards for radiation protection (part 20 of this chapter).

(c) The Atomic Energy Act of 1954 had the effect of preempting to the Federal Government the field of regulation of nuclear facilities and byproduct, source, and special nuclear material. Whatever doubts may have existed as to that preemption were settled by the passage of the Federal-State amendment to the Atomic Energy Act of 1954 in 1959.<sup>13</sup>

(d) Prior to 1954, all nuclear facilities and the special nuclear material produced by or used in them were owned by the AEC.<sup>14</sup> This Federal monopoly of atomic energy activities was due in large part to the use of atomic energy materials and facilities in our national weapons program, and the large capital investment required for their development. The Atomic Energy Act of 1954 permitted private ownership of nuclear facilities for the first time, but only

<sup>12</sup> The terms "byproduct material," "source material," and "special nuclear material" are defined in the Atomic Energy Act, sections 11e, 11z, and 11aa, respectively. The terms "production facility" and "utilization facility" are defined in sections 11v and 11cc of the Act, respectively.

<sup>13</sup> Pub. L. 86-373, 73 Stat. 688.

<sup>14</sup> Atomic Energy Act of 1946, Pub. L. 79-585, 60 Stat. 755.

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under a comprehensive, pervasive system of Federal regulation and licensing. That Act recognized no State responsibility or authority over such facilities and materials except the States' traditional regulatory authority over generation, sale, and transmission of electric power produced through the use of nuclear facilities.<sup>15</sup> As interest grew in the private construction of facilities and the use of atomic energy materials, and the numbers of persons qualified in the field increased, questions arose as to the role State authorities should play with regard to the public health and safety aspects of such activities. Several bills were introduced with respect to Federal-State cooperation in 1956 and 1957.<sup>16</sup> An AEC proposed bill which would have authorized concurrent radiation safety standards to be enforced by the States was forwarded to the Joint Committee on Atomic Energy in 1957, but was never reported out. Finally, in 1959, legislation was enacted whose purpose was to promote an orderly regulatory pattern between the Federal and State governments with respect to regulation of byproduct, source, and special nuclear material, while avoiding dual regulation (see section 274a). That legislation added section 274, the so-called Federal-State amendment, to the Atomic Energy Act.

(e) Section 274 (42 U.S.C. 2021) authorizes the Commission to enter into an agreement with the Governor of any State providing for the discontinuance of regulatory authority of the Commission with respect to byproduct materials, source materials, and special nuclear materials in quantities not sufficient to form a "critical mass." However, section 274c (42 U.S.C. 2021(c)) provides that the Commission shall retain authority and responsibility with respect to the regulation of:

(1) The construction and operation of production or utilization facilities (note: this includes construction and operation of nuclear power plants);

(2) The export and import of by-product, source or special nuclear material or production or utilization facilities;

(3) The disposal into the ocean of waste byproduct, source or special nuclear materials; and

(4) The disposal of such other byproduct, source or special nuclear material as the Commission determines should, because of the hazards or potential hazards thereof, not be so disposed of without a Commission license.

(f) The amendment, in providing for the discontinuance of some of the AEC's regulatory authority over source, by-product and special nuclear material in States which entered into agreements with the AEC, made clear that there should be no "dual regulation" with respect to those materials for the purpose of protection of the public health and safety from radiation hazards.

(g) Section 274b of the Atomic Energy Act (42 U.S.C. 2021(b)) states that:

During the duration of such an agreement it is recognized that the State shall have authority to regulate the materials covered by the agreement for the protection of the public health and safety from radiation hazards.

Section 274k (42 U.S.C. 2021(k)) states:

Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.

(h) In its comments on the bill that was enacted as section 274, the Joint Committee on Atomic Energy commented that:

It is not intended to leave any room for the exercise of dual or concurrent jurisdiction by States to control radiation hazards by regulating byproduct, source, or special nuclear materials. The intent is to have the material regulated and licensed either by the Commission, or by the State and local governments, but not by both.<sup>17</sup>

In explaining section 274k, the Joint Committee said:

As indicated elsewhere, the Commission has exclusive authority to regulate for protection against radiation hazards until such time as the State enters into an agreement with the Commission to assume such responsibility.<sup>18</sup>

<sup>15</sup> Sec. 271, 42 U.S.C. 2018.

<sup>16</sup> S. 4298 and H.R. 8676, 84th Cong., second session; S. 53, 85th Cong., first session.

<sup>17</sup> 1959 U.S. Code Congressional and Administrative News, v. 2, p. 2879.

<sup>18</sup> Id. at pp. 2882-3.

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(i) It seems completely clear that the Congress, in enacting section 274, intended to preempt to the Federal Government the total responsibility and authority for regulating, from the standpoint of radiological health and safety, the specified nuclear facilities and materials; that it stated that intent unequivocally; and that the enactment of section 274 effectively carried out the Congressional intent, subject to the arrangement for limited relinquishment of AEC's regulatory authority and assumption thereof by states in areas permitted, and subject to conditions imposed, by section 274.<sup>19</sup>

(j) Thus, under the pattern of the Atomic Energy Act, as amended by section 274, States which have not entered into a section 274 agreement with the AEC are without authority to license or regulate, from the standpoint of radiological health and safety, byproduct, source, and special nuclear material or production and utilization facilities. Even those States which have entered into a section 274 agreement with the AEC (Agreement States) lack authority to license or regulate, from the standpoint of radiological health and safety, the construction and operation of production and utilization facilities (including nuclear power plants) and other activities reserved to the AEC by section 274c. (To the extent that Agreement States have authority to regulate byproduct, source, and special nuclear material, their section 274 Agreements require them to use their best efforts to assure that their regulatory programs for protection against radiation hazards will continue to be compatible with the AEC's program for

the regulation of byproduct, source and special nuclear material.)

(k) The following judicial precedents and legal authorities support the foregoing conclusions: Northern California Ass'n, Etc. v. Public Utilities Commission, 37 Cal. Rep. 432, 390 P. 2d 200 (1964); Boswell v. City of Long Beach, CCH Atomic Energy Law Reports, par. 4045 (1960); Opinion of the Attorney General of Michigan (Oct. 31, 1962); Opinion of the Attorney General of South Dakota (July 23, 1964); New York State Bar Association, Committee on Atomic Energy, State Jurisdiction to Regulate Atomic Activities (July 12, 1963). No precedents or authorities to the contrary have come to our attention.

[34 FR 7273, May 3, 1969]

**§8.5 Interpretation by the General Counsel of § 73.55 of this chapter; illumination and physical search requirements.**

(a) A request has been received to interpret 10 CFR 73.55(c)(5) and 73.55(d)(1). 10 CFR 73.55(c)(5) provides:

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

(b) The requester contends that the regulation is satisfied if 0.2 footcandle is provided only at the protected area boundary and the isolation zone. The language of the regulation is clearly to the contrary. It requires not less than 0.2 footcandle for "all exterior areas within the protected area." This regulation helps effectuate the monitoring and observation requirements of 10 CFR 73.55. For example, 10 CFR 73.55(c)(4) states that "All exterior areas within the protected area shall be periodically checked to detect the presence of unauthorized persons, vehicles, or materials." In the absence of illumination, such checking could not be fully effective.

(c) The requester also asks whether the illumination requirement extends to the tops and sides of buildings within the protected area. To effectuate the monitoring and observation requirements cited above, illumination must

<sup>19</sup> As noted above, regulation of construction and operation of production or utilization facilities was one of the areas reserved to the AEC. It is clear from the legislative history of section 274 that control of "operation" of such facilities includes the regulation of the radiological effects of the discharge of effluents from the facilities. (Hearings before the Joint Committee on Atomic Energy on Federal-State Relationships in the Atomic Energy Field, 86th Cong., first session, 1959, p. 306.) AEC regulations implementing section 274 recognize that intent by defining facility operation to include the discharge of radioactive effluents from the facility site (10 CFR 150.15).

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## § 20.1002 Scope.

The regulations in this part apply to persons licensed by the Commission to receive, possess, use, transfer, or dispose of byproduct, source, or special nuclear material or to operate a production or utilization facility under parts 30 through 36, 39, 40, 50, 52, 60, 61, 63, 70, or 72 of this chapter, and in accordance with 10 CFR 76.60 to persons required to obtain a certificate of compliance or an approved compliance plan under part 76 of this chapter. The limits in this part do not apply to doses due to background radiation, to exposure of patients to radiation for the purpose of medical diagnosis or therapy, to exposure from individuals administered radioactive material and released under § 35.75, or to exposure from voluntary participation in medical research programs.

[72 FR 49485, Aug. 28, 2007]

## § 20.1003 Definitions.

As used in this part:

*Absorbed dose* means the energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the rad and the gray (Gy).

*Accelerator-produced radioactive material* means any material made radioactive by a particle accelerator.

*Act* means the Atomic Energy Act of 1954 (42 U.S.C. 2011 *et seq.*), as amended.

*Activity* is the rate of disintegration (transformation) or decay of radioactive material. The units of activity are the curie (Ci) and the becquerel (Bq).

*Adult* means an individual 18 or more years of age.

*Airborne radioactive material* means radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases.

*Airborne radioactivity area* means a room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations—

(1) In excess of the derived air concentrations (DACs) specified in appendix B, to §§ 20.1001–20.2401, or

(2) To such a degree that an individual present in the area without respiratory protective equipment could

exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.

*Air-purifying respirator* means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

*ALARA* (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

*Annual limit on intake (ALI)* means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5 rems (0.05 Sv) or a committed dose equivalent of 50 rems (0.5 Sv) to any individual organ or tissue. (ALI values for intake by ingestion and by inhalation of selected radionuclides are given in table 1, columns 1 and 2, of appendix B to §§ 20.1001–20.2401).

*Assigned protection factor (APF)* means the expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.

*Atmosphere-supplying respirator* means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air

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respirators (SARs) and self-contained breathing apparatus (SCBA) units.

*Background radiation* means radiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. "*Background radiation*" does not include radiation from source, byproduct, or special nuclear materials regulated by the Commission.

*Bioassay* (radiobioassay) means the determination of kinds, quantities or concentrations, and, in some cases, the locations of radioactive material in the human body, whether by direct measurement (in vivo counting) or by analysis and evaluation of materials excreted or removed from the human body.

*Byproduct material* means—

(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material;

(2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition;

(3)(i) Any discrete 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; or

(ii) Any material that—

(A) Has been made radioactive by use of a particle accelerator; and

(B) Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and

(4) Any discrete source of naturally occurring radioactive material, other than source material, that—

(i) The Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate Federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and

(ii) Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

*Class* (or *lung class* or *inhalation class*) means a classification scheme for inhaled material according to its rate of clearance from the pulmonary region of the lung. Materials are classified as D, W, or Y, which applies to a range of clearance half-times: for Class D (Days) of less than 10 days, for Class W (Weeks) from 10 to 100 days, and for Class Y (Years) of greater than 100 days.

*Collective dose* is the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.

*Commission* means the Nuclear Regulatory Commission or its duly authorized representatives.

*Committed dose equivalent* ( $H_{T,50}$ ) means the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

*Committed effective dose equivalent* ( $H_{E,50}$ ) is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues ( $H_{E,50} = \sum w_T H_{T,50}$ ).

*Constraint (dose constraint)* means a value above which specified licensee actions are required.

*Controlled area* means an area, outside of a restricted area but inside the site boundary, access to which can be limited by the licensee for any reason.

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*Critical Group* means the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances.

*Declared pregnant woman* means a woman who has voluntarily informed the licensee, in writing, of her pregnancy and the estimated date of conception. The declaration remains in effect until the declared pregnant woman withdraws the declaration in writing or is no longer pregnant.

*Decommission* means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits—

(1) Release of the property for unrestricted use and termination of the license; or

(2) Release of the property under restricted conditions and the termination of the license.

*Deep-dose equivalent* ( $H_d$ ), which applies to external whole-body exposure, is the dose equivalent at a tissue depth of 1 cm (1000 mg/cm<sup>2</sup>).

*Demand respirator* means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

*Department* means the Department of Energy established by the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565, 42 U.S.C. 7101 *et seq.*) to the extent that the Department, or its duly authorized representatives, exercises functions formerly vested in the U.S. Atomic Energy Commission, its Chairman, members, officers, and components and transferred to the U.S. Energy Research and Development Administration and to the Administrator thereof pursuant to sections 104 (b), (c), and (d) of the Energy Reorganization Act of 1974 (Pub. L. 93-438, 88 Stat. 1233 at 1237, 42 U.S.C. 5814) and retransferred to the Secretary of Energy pursuant to section 301(a) of the Department of Energy Organization Act (Pub. L. 95-91, 91 Stat. 565 at 577-578, 42 U.S.C. 7151).

*Derived air concentration* (DAC) means the concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate 1.2 cubic meters of air per hour), results in an intake of

one ALI. DAC values are given in table 1, column 3, of appendix B to §§20.1001-20.2401.

*Derived air concentration-hour* (DAC-hour) is the product of the concentration of radioactive material in air (expressed as a fraction or multiple of the derived air concentration for each radionuclide) and the time of exposure to that radionuclide, in hours. A licensee may take 2,000 DAC-hours to represent one ALI, equivalent to a committed effective dose equivalent of 5 rems (0.05 Sv).

*Discrete source* means 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.

*Disposable respirator* means a respirator for which maintenance is not intended and that is designed to be discarded after excessive breathing resistance, sorbent exhaustion, physical damage, or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).

*Distinguishable from background* means that the detectable concentration of a radionuclide is statistically different from the background concentration of that radionuclide in the vicinity of the site or, in the case of structures, in similar materials using adequate measurement technology, survey, and statistical techniques.

*Dose or radiation dose* is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent, as defined in other paragraphs of this section.

*Dose equivalent* ( $H_T$ ) means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv).

*Dosimetry processor* means an individual or organization that processes and evaluates individual monitoring equipment in order to determine the radiation dose delivered to the equipment.

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*Effective dose equivalent* ( $H_E$ ) is the sum of the products of the dose equivalent to the organ or tissue ( $H_T$ ) and the weighting factors ( $w_T$ ) applicable to each of the body organs or tissues that are irradiated ( $H_E = \sum w_T H_T$ ).

*Embryo/fetus* means the developing human organism from conception until the time of birth.

*Entrance or access point* means any location through which an individual could gain access to radiation areas or to radioactive materials. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.

*Exposure* means being exposed to ionizing radiation or to radioactive material.

*External dose* means that portion of the dose equivalent received from radiation sources outside the body.

*Extremity* means hand, elbow, arm below the elbow, foot, knee, or leg below the knee.

*Filtering facepiece (dust mask)* means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium, not equipped with elastomeric sealing surfaces and adjustable straps.

*Fit factor* means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

*Fit test* means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

*Generally applicable environmental radiation standards* means standards issued by the Environmental Protection Agency (EPA) under the authority of the Atomic Energy Act of 1954, as amended, that impose limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

*Government agency* means any executive department, commission, independent establishment, corporation wholly or partly owned by the United

States of America, which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government.

*Gray* [See § 20.1004].

*Helmet* means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

*High radiation area* means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the radiation source or 30 centimeters from any surface that the radiation penetrates.

*Hood* means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

*Individual* means any human being.

*Individual monitoring* means—

(1) The assessment of dose equivalent by the use of devices designed to be worn by an individual;

(2) The assessment of committed effective dose equivalent by bioassay (see *Bioassay*) or by determination of the time-weighted air concentrations to which an individual has been exposed, i.e., DAC-hours; or

(3) The assessment of dose equivalent by the use of survey data.

*Individual monitoring devices* (individual monitoring equipment) means devices designed to be worn by a single individual for the assessment of dose equivalent such as film badges, thermoluminescence dosimeters (TLDs), pocket ionization chambers, and personal ("lapel") air sampling devices.

*Internal dose* means that portion of the dose equivalent received from radioactive material taken into the body.

*Lens dose equivalent (LDE)* applies to the external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 mg/cm<sup>2</sup>).

*License* means a license issued under the regulations in parts 30 through 36, 39, 40, 50, 60, 61, 63, 70, or 72 of this chapter.

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*Licensed material* means source material, special nuclear material, or by-product material received, possessed, used, transferred or disposed of under a general or specific license issued by the Commission.

*Licensee* means the holder of a license.

*Limits* (dose limits) means the permissible upper bounds of radiation doses.

*Loose-fitting facepiece* means a respiratory inlet covering that is designed to form a partial seal with the face.

*Lost or missing licensed material* means licensed material whose location is unknown. It includes material that has been shipped but has not reached its destination and whose location cannot be readily traced in the transportation system.

*Member of the public* means any individual except when that individual is receiving an occupational dose.

*Minor* means an individual less than 18 years of age.

*Monitoring* (radiation monitoring, radiation protection monitoring) means the measurement of radiation levels, concentrations, surface area concentrations or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses.

*Nationally tracked source* is a sealed source containing a quantity equal to or greater than Category 1 or Category 2 levels of any radioactive material listed in Appendix E of this part. In this context a sealed source is defined as radioactive material that is sealed in a capsule or closely bonded, in a solid form and which is not exempt from regulatory control. It does not mean material encapsulated solely for disposal, or nuclear material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet. Category 1 nationally tracked sources are those containing radioactive material at a quantity equal to or greater than the Category 1 threshold. Category 2 nationally tracked sources are those containing radioactive material at a quantity equal to or greater than the Category 2 threshold but less than the Category 1 threshold.

*Negative pressure respirator (tight fitting)* means a respirator in which the

air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

*Nonstochastic effect* means health effects, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation-induced cataract formation is an example of a nonstochastic effect (also called a deterministic effect).

*NRC* means the Nuclear Regulatory Commission or its duly authorized representatives.

*Occupational dose* means the dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Occupational dose does not include doses received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under §35.75, from voluntary participation in medical research programs, or as a member of the public.

*Particle accelerator* means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 megaelectron volt. For purposes of this definition, "accelerator" is an equivalent term.

*Person* means—

(1) Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission or the Department of Energy (except that the Department shall be considered a person within the meaning of the regulations in 10 CFR chapter I to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission under section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244), the Uranium Mill Tailings Radiation Control Act of 1978

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(92 Stat. 3021), the Nuclear Waste Policy Act of 1982 (96 Stat. 2201), and section 3(b)(2) of the Low-Level Radioactive Waste Policy Amendments Act of 1985 (99 Stat. 1842)), any State or any political subdivision of or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and

(2) Any legal successor, representative, agent, or agency of the foregoing.

*Planned special exposure* means an infrequent exposure to radiation, separate from and in addition to the annual dose limits.

*Positive pressure respirator* means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

*Powered air-purifying respirator (PAPR)* means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

*Pressure demand respirator* means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

*Public dose* means the dose received by a member of the public from exposure to radiation or to radioactive material released by a licensee, or to any other source of radiation under the control of a licensee. Public dose does not include occupational dose or doses received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under § 35.75, or from voluntary participation in medical research programs.

*Qualitative fit test (QLFT)* means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

*Quality Factor (Q)* means the modifying factor (listed in tables 1004(b).1 and 1004(b).2 of § 20.1004) that is used to derive dose equivalent from absorbed dose.

*Quantitative fit test (QNFT)* means an assessment of the adequacy of respirator fit by numerically measuring

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the amount of leakage into the respirator.

*Quarter* means a period of time equal to one-fourth of the year observed by the licensee (approximately 13 consecutive weeks), providing that the beginning of the first quarter in a year coincides with the starting date of the year and that no day is omitted or duplicated in consecutive quarters.

*Rad* (See § 20.1004).

*Radiation* (ionizing radiation) means alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in this part, does not include non-ionizing radiation, such as radio- or microwaves, or visible, infrared, or ultraviolet light.

*Radiation area* means an area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

*Reference man* means a hypothetical aggregation of human physical and physiological characteristics arrived at by international consensus. These characteristics may be used by researchers and public health workers to standardize results of experiments and to relate biological insult to a common base.

*Rem* (See § 20.1004).

*Residual radioactivity* means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 10 CFR part 20.

*Respiratory protective device* means an apparatus, such as a respirator, used to reduce the individual's intake of airborne radioactive materials.

*Restricted area* means an area, access to which is limited by the licensee for

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the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area.

*Sanitary sewerage* means a system of public sewers for carrying off waste water and refuse, but excluding sewage treatment facilities, septic tanks, and leach fields owned or operated by the licensee.

*Self-contained breathing apparatus (SCBA)* means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

*Shallow-dose equivalent ( $H_s$ )*, which applies to the external exposure of the skin of the whole body or the skin of an extremity, is taken as the dose equivalent at a tissue depth of 0.007 centimeter ( $7 \text{ mg/cm}^2$ ).

*Site boundary* means that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.

*Source material* means—

(1) Uranium or thorium or any combination of uranium and thorium in any physical or chemical form; or

(2) Ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material.

*Special nuclear material* means—

(1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or

(2) Any material artificially enriched by any of the foregoing but does not include source material.

*Stochastic effects* means health effects that occur randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects.

*Supplied-air respirator (SAR) or airline respirator* means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

*Survey* means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.

*Tight-fitting facepiece* means a respiratory inlet covering that forms a complete seal with the face.

*Total Effective Dose Equivalent (TEDE)* means the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

*Unrestricted area* means an area, access to which is neither limited nor controlled by the licensee.

*Uranium fuel cycle* means the operations of milling of uranium ore, chemical conversion of uranium, isotopic enrichment of uranium, fabrication of uranium fuel, generation of electricity by a light-water-cooled nuclear power plant using uranium fuel, and reprocessing of spent uranium fuel to the extent that these activities directly support the production of electrical power for public use. Uranium fuel cycle does not include mining operations, operations at waste disposal sites, transportation of radioactive material in support of these operations, and the reuse of recovered non-uranium special nuclear and byproduct materials from the cycle.

*User seal check (fit check)* means an action conducted by the respirator user to determine if the respirator is properly seated to the face. Examples include negative pressure check, positive pressure check, irritant smoke check, or isoamyl acetate check.

*Very high radiation area* means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving an absorbed dose in excess of 500 rads (5

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grays) in 1 hour at 1 meter from a radiation source or 1 meter from any surface that the radiation penetrates.

NOTE: At very high doses received at high dose rates, units of absorbed dose (e.g., rads and grays) are appropriate, rather than units of dose equivalent (e.g., rems and sieverts).

Waste means those low-level radioactive wastes containing source, special nuclear, or byproduct material that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level radioactive waste means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in paragraphs (2), (3), and (4) of the definition of Byproduct material set forth in this section.

Week means 7 consecutive days starting on Sunday.

Weighting factor  $w_T$ , for an organ or tissue (T) is the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of  $w_T$  are:

ORGAN DOSE WEIGHTING FACTORS

Organ or tissue	$w_T$
Gonads .....	0.25
Breast .....	0.15
Red bone marrow .....	0.12
Lung .....	0.12
Thyroid .....	0.03
Bone surfaces .....	0.03
Remainder .....	<sup>1</sup> 0.30
Whole Body .....	<sup>2</sup> 1.00

<sup>1</sup>0.30 results from 0.06 for each of 5 "remainder" organs (excluding the skin and the lens of the eye) that receive the highest doses.

<sup>2</sup>For the purpose of weighting the external whole body dose (for adding it to the internal dose), a single weighting factor,  $w_T=1.0$ , has been specified. The use of other weighting factors for external exposure will be approved on a case-by-case basis until such time as specific guidance is issued.

Whole body means, for purposes of external exposure, head, trunk (including male gonads), arms above the elbow, or legs above the knee.

Working level (WL) is any combination of short-lived radon daughters (for radon-222: polonium-218, lead-214, bismuth-214, and polonium-214; and for radon-220: polonium-216, lead-212, bismuth-212, and polonium-212) in 1 liter of air that will result in the ultimate emission of  $1.3 \times 10^5$  MeV of potential alpha particle energy.

Working level month (WLM) means an exposure to 1 working level for 170 hours (2,000 working hours per year/12 months per year=approximately 170 hours per month).

Year means the period of time beginning in January used to determine compliance with the provisions of this part. The licensee may change the starting date of the year used to determine compliance by the licensee provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

[56 FR 23391, May 21, 1991, as amended at 57 FR 57878, Dec. 8, 1992; 58 FR 7736, Feb. 9, 1993; 60 FR 36043, July 13, 1995; 60 FR 48625, Sept. 20, 1995; 61 FR 65127, Dec. 10, 1996; 62 FR 4133, Jan. 29, 1997; 62 FR 39087, July 21, 1997; 63 FR 39481, July 23, 1998; 64 FR 54556, Oct. 7, 1999; 66 FR 55789, Nov. 2, 2001; 67 FR 16304, Apr. 5, 2002; 67 FR 20370, Apr. 24, 2002; 67 FR 62872, Oct. 9, 2002; 71 FR 65707, Nov. 8, 2006; 72 FR 55921, Oct. 1, 2007; 72 FR 68058, Dec. 4, 2007; 74 FR 62680, Dec. 1, 2009]

## §20.1004 Units of radiation dose.

(a) *Definitions.* As used in this part, the units of radiation dose are:

Gray (Gy) is the SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 Joule/kilogram (100 rads).

Rad is the special unit of absorbed dose. One rad is equal to an absorbed dose of 100 ergs/gram or 0.01 joule/kilogram (0.01 gray).

Rem is the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor (1 rem=0.01 sievert).

Sievert is the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (1 Sv=100 rems).

(b) As used in this part, the quality factors for converting absorbed dose to dose equivalent are shown in table 1004(b).1.

**Nuclear Regulatory Commission****§ 20.1201****Subpart B—Radiation Protection Programs**

SOURCE: 56 FR 23396, May 21, 1991, unless otherwise noted.

**§ 20.1101 Radiation protection programs.**

(a) Each licensee shall develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of this part. (See § 20.2102 for recordkeeping requirements relating to these programs.)

(b) The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).

(c) The licensee shall periodically (at least annually) review the radiation protection program content and implementation.

(d) To implement the ALARA requirements of § 20.1101 (b), and notwithstanding the requirements in § 20.1301 of this part, a constraint on air emissions of radioactive material to the environment, excluding Radon-222 and its daughters, shall be established by licensees other than those subject to § 50.34a, such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions. If a licensee subject to this requirement exceeds this dose constraint, the licensee shall report the exceedance as provided in § 20.2203 and promptly take appropriate corrective action to ensure against recurrence.

[56 FR 23396, May 21, 1991, as amended at 61 FR 65127, Dec. 10, 1996; 63 FR 39482, July 23, 1998]

**Subpart C—Occupational Dose Limits**

SOURCE: 56 FR 23396, May 21, 1991, unless otherwise noted.

**§ 20.1201 Occupational dose limits for adults.**

(a) The licensee shall control the occupational dose to individual adults, except for planned special exposures under § 20.1206, to the following dose limits.

(1) An annual limit, which is the more limiting of—

(i) The total effective dose equivalent being equal to 5 rems (0.05 Sv); or

(ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 Sv).

(2) The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are:

(i) A lens dose equivalent of 15 rems (0.15 Sv), and

(ii) A shallow-dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity.

(b) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year (see § 20.1206(e)(1)) and during the individual's lifetime (see § 20.1206(e)(2)).

(c) When the external exposure is determined by measurement with an external personal monitoring device, the deep-dose equivalent must be used in place of the effective dose equivalent, unless the effective dose equivalent is determined by a dosimetry method approved by the NRC. The assigned deep-dose equivalent must be for the part of the body receiving the highest exposure. The assigned shallow-dose equivalent must be the dose averaged over the contiguous 10 square centimeters of skin receiving the highest exposure. The deep-dose equivalent, lens-dose equivalent, and shallow-dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.

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demonstrate that the limit in § 20.1201(a)(1)(ii) is met.

[56 FR 23396, May 21, 1991, as amended at 60 FR 20185, Apr. 25, 1995]

**§ 20.1205 [Reserved]****§ 20.1206 Planned special exposures.**

A licensee may authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in § 20.1201 provided that each of the following conditions is satisfied—

(a) The licensee authorizes a planned special exposure only in an exceptional situation when alternatives that might avoid the dose estimated to result from the planned special exposure are unavailable or impractical.

(b) The licensee (and employer if the employer is not the licensee) specifically authorizes the planned special exposure, in writing, before the exposure occurs.

(c) Before a planned special exposure, the licensee ensures that the individuals involved are—

(1) Informed of the purpose of the planned operation;

(2) Informed of the estimated doses and associated potential risks and specific radiation levels or other conditions that might be involved in performing the task; and

(3) Instructed in the measures to be taken to keep the dose ALARA considering other risks that may be present.

(d) Prior to permitting an individual to participate in a planned special exposure, the licensee ascertains prior doses as required by § 20.2104(b) during the lifetime of the individual for each individual involved.

(e) Subject to § 20.1201(b), the licensee does not authorize a planned special exposure that would cause an individual to receive a dose from all planned special exposures and all doses in excess of the limits to exceed—

(1) The numerical values of any of the dose limits in § 20.1201(a) in any year; and

(2) Five times the annual dose limits in § 20.1201(a) during the individual's lifetime.

(f) The licensee maintains records of the conduct of a planned special exposure in accordance with § 20.2105 and

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submits a written report in accordance with § 20.2204.

(g) The licensee records the best estimate of the dose resulting from the planned special exposure in the individual's record and informs the individual, in writing, of the dose within 30 days from the date of the planned special exposure. The dose from planned special exposures is not to be considered in controlling future occupational dose of the individual under § 20.1201(a) but is to be included in evaluations required by § 20.1206 (d) and (e).

[56 FR 23396, May 21, 1991, as amended at 63 FR 39482, July 23, 1998]

**§ 20.1207 Occupational dose limits for minors.**

The annual occupational dose limits for minors are 10 percent of the annual dose limits specified for adult workers in § 20.1201.

**§ 20.1208 Dose equivalent to an embryo/fetus.**

(a) The licensee shall ensure that the dose equivalent to the embryo/fetus during the entire pregnancy, due to the occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv). (For recordkeeping requirements, see § 20.2106.)

(b) The licensee shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in paragraph (a) of this section.

(c) The dose equivalent to the embryo/fetus is the sum of—

(1) The deep-dose equivalent to the declared pregnant woman; and

(2) The dose equivalent to the embryo/fetus resulting from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

(d) If the dose equivalent to the embryo/fetus is found to have exceeded 0.5 rem (5 mSv), or is within 0.05 rem (0.5 mSv) of this dose, by the time the woman declares the pregnancy to the licensee, the licensee shall be deemed to be in compliance with paragraph (a) of this section if the additional dose equivalent to the embryo/fetus does

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not exceed 0.05 rem (0.5 mSv) during the remainder of the pregnancy.

[56 FR 23396, May 21, 1991, as amended at 63 FR 39482, July 23, 1998]

**Subpart D—Radiation Dose Limits for Individual Members of the Public**

SOURCE: 56 FR 23398, May 21, 1991, unless otherwise noted.

**§ 20.1301 Dose limits for individual members of the public.**

(a) Each licensee shall conduct operations so that—

(1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under § 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with § 20.2003, and

(2) The dose in any unrestricted area from external sources, exclusive of the dose contributions from patients administered radioactive material and released in accordance with § 35.75, does not exceed 0.002 rem (0.02 millisievert) in any one hour.

(b) If the licensee permits members of the public to have access to controlled areas, the limits for members of the public continue to apply to those individuals.

(c) Notwithstanding paragraph (a)(1) of this section, a licensee may permit visitors to an individual who cannot be released, under § 35.75, to receive a radiation dose greater than 0.1 rem (1 mSv) if—

(1) The radiation dose received does not exceed 0.5 rem (5 mSv); and

(2) The authorized user, as defined in 10 CFR Part 35, has determined before the visit that it is appropriate.

(d) A licensee or license applicant may apply for prior NRC authorization to operate up to an annual dose limit for an individual member of the public

of 0.5 rem (5 mSv). The licensee or license applicant shall include the following information in this application:

(1) Demonstration of the need for and the expected duration of operations in excess of the limit in paragraph (a) of this section;

(2) The licensee's program to assess and control dose within the 0.5 rem (5 mSv) annual limit; and

(3) The procedures to be followed to maintain the dose as low as is reasonably achievable.

(e) In addition to the requirements of this part, a licensee subject to the provisions of EPA's generally applicable environmental radiation standards in 40 CFR part 190 shall comply with those standards.

(f) The Commission may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a licensee may release in effluents in order to restrict the collective dose.

[56 FR 23398, May 21, 1991, as amended at 60 FR 48625, Sept. 20, 1995; 62 FR 4133, Jan. 29, 1997; 67 FR 20370, Apr. 24, 2002; 67 FR 62872, Oct. 9, 2002]

**§ 20.1302 Compliance with dose limits for individual members of the public.**

(a) The licensee shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in § 20.1301.

(b) A licensee shall show compliance with the annual dose limit in § 20.1301 by—

(1) Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operation does not exceed the annual dose limit; or

(2) Demonstrating that—

(i) The annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in table 2 of appendix B to part 20; and

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1974, as amended. This provision will be enforced through agency provisions and regulations similar to those already established, with respect to racial and other discrimination, under Title VI of the Civil Rights Act of 1964. This remedy is not exclusive, however, and will not prejudice or cut off any other legal remedies available to a discriminatee.

[72 FR 49485, Aug. 28, 2007]

**§ 19.40 Criminal penalties.**

(a) Section 223 of the Atomic Energy Act of 1954, as amended, provides for criminal sanctions for willful violation of, attempted violation of, or conspiracy to violate, any regulation issued under sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in part 19 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in part 19 that are not issued under sections 161b, 161i, or 161o for the purposes of section 223 are as follows: §§19.1, 19.2, 19.3, 19.4, 19.5, 19.8, 19.16, 19.17, 19.18, 19.30, 19.31, and 19.40.

[57 FR 55071, Nov. 24, 1992]

**PART 20—STANDARDS FOR PROTECTION AGAINST RADIATION****Subpart A—General Provisions**

Sec.

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- 20.1004 Units of radiation dose.
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**Subpart B—Radiation Protection Programs**

- 20.1101 Radiation protection programs.

**Subpart C—Occupational Dose Limits**

- 20.1201 Occupational dose limits for adults.
- 20.1202 Compliance with requirements for summation of external and internal doses.
- 20.1203 Determination of external dose from airborne radioactive material.
- 20.1204 Determination of internal exposure.

- 20.1205 [Reserved]
- 20.1206 Planned special exposures.
- 20.1207 Occupational dose limits for minors.
- 20.1208 Dose equivalent to an embryo/fetus.

**Subpart D—Radiation Dose Limits for Individual Members of the Public**

- 20.1301 Dose limits for individual members of the public.
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(ii) If an individual were continuously present in an unrestricted area, the dose from external sources would not exceed 0.002 rem (0.02 mSv) in an hour and 0.05 rem (0.5 mSv) in a year.

(c) Upon approval from the Commission, the licensee may adjust the effluent concentration values in appendix B to part 20, table 2, for members of the public, to take into account the actual physical and chemical characteristics of the effluents (e.g., aerosol size distribution, solubility, density, radioactive decay equilibrium, chemical form).

[56 FR 23398, May 21, 1991; 56 FR 61352, Dec. 3, 1991, as amended at 57 FR 57878, Dec. 8, 1992; 60 FR 20185, Apr. 25, 1995]

### **Subpart E—Radiological Criteria for License Termination**

SOURCE: 62 FR 39088, July 21, 1997, unless otherwise noted.

#### **§ 20.1401 General provisions and scope.**

(a) The criteria in this subpart apply to the decommissioning of facilities licensed under parts 30, 40, 50, 52, 60, 61, 63, 70, and 72 of this chapter, and release of part of a facility or site for unrestricted use in accordance with § 50.83 of this chapter, as well as other facilities subject to the Commission's jurisdiction under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended. For high-level and low-level waste disposal facilities (10 CFR parts 60, 61, and 63), the criteria apply only to ancillary surface facilities that support radioactive waste disposal activities. The criteria do not apply to uranium and thorium recovery facilities already subject to appendix A to 10 CFR part 40 or the uranium solution extraction facilities.

(b) The criteria in this subpart do not apply to sites which:

(1) Have been decommissioned prior to the effective date of the rule in accordance with criteria identified in the Site Decommissioning Management Plan (SDMP) Action Plan of April 16, 1992 (57 FR 13389);

(2) Have previously submitted and received Commission approval on a license termination plan (LTP) or de-

commissioning plan that is compatible with the SDMP Action Plan criteria; or

(3) Submit a sufficient LTP or decommissioning plan before August 20, 1998 and such LTP or decommissioning plan is approved by the Commission before August 20, 1999 and in accordance with the criteria identified in the SDMP Action Plan, except that if an EIS is required in the submittal, there will be a provision for day-for-day extension.

(c) After a site has been decommissioned and the license terminated in accordance with the criteria in this subpart, or after part of a facility or site has been released for unrestricted use in accordance with § 50.83 of this chapter and in accordance with the criteria in this subpart, the Commission will require additional cleanup only, if based on new information, it determines that the criteria of this subpart were not met and residual radioactivity remaining at the site could result in significant threat to public health and safety.

(d) When calculating TEDE to the average member of the critical group the licensee shall determine the peak annual TEDE dose expected within the first 1000 years after decommissioning.

[62 FR 39088, July 21, 1997, as amended at 66 FR 55789, Nov. 2, 2001; 68 FR 19726, Apr. 22, 2003; 72 FR 49485, Aug. 28, 2007]

#### **§ 20.1402 Radiological criteria for unrestricted use.**

A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.

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**§ 20.1403 Criteria for license termination under restricted conditions.**

A site will be considered acceptable for license termination under restricted conditions if:

(a) The licensee can demonstrate that further reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal;

(b) The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year;

(c) The licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site. Acceptable financial assurance mechanisms are—

(1) Funds placed into an account segregated from the licensee's assets and outside the licensee's administrative control as described in § 30.35(f)(1) of this chapter;

(2) Surety method, insurance, or other guarantee method as described in § 30.35(f)(2) of this chapter;

(3) A statement of intent in the case of Federal, State, or local Government licensees, as described in § 30.35(f)(4) of this chapter; or

(4) When a government entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity.

(d) The licensee has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission in accordance with §§ 30.36(d), 40.42(d), 50.82 (a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee intends to

decommission by restricting use of the site. The licensee shall document in the LTP or decommissioning plan how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice.

(1) Licensees proposing to decommission by restricting use of the site shall seek advice from such affected parties regarding the following matters concerning the proposed decommissioning—

(i) Whether provisions for institutional controls proposed by the licensee:

(A) Will provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) TEDE per year;

(B) Will be enforceable; and

(C) Will not impose undue burdens on the local community or other affected parties.

(ii) Whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site;

(2) In seeking advice on the issues identified in § 20.1403(d)(1), the licensee shall provide for:

(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement or disagreement among the participants on the issues; and

(e) Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is

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as low as reasonably achievable and would not exceed either—

- (1) 100 mrem (1 mSv) per year; or
- (2) 500 mrem (5 mSv) per year provided that the licensee—

(i) Demonstrates that further reductions in residual radioactivity necessary to comply with the 100 mrem/y (1 mSv/y) value of paragraph (e)(1) of this section are not technically achievable, would be prohibitively expensive, or would result in net public or environmental harm;

(ii) Makes provisions for durable institutional controls;

(iii) Provides sufficient financial assurance to enable a responsible government entity or independent third party, including a governmental custodian of a site, both to carry out periodic rechecks of the site no less frequently than every 5 years to assure that the institutional controls remain in place as necessary to meet the criteria of §20.1403(b) and to assume and carry out responsibilities for any necessary control and maintenance of those controls. Acceptable financial assurance mechanisms are those in paragraph (c) of this section.

**§ 20.1404 Alternate criteria for license termination.**

(a) The Commission may terminate a license using alternate criteria greater than the dose criterion of §§20.1402, 20.1403(b), and 20.1403(d)(1)(i)(A), if the licensee—

(1) Provides assurance that public health and safety would continue to be protected, and that it is unlikely that the dose from all man-made sources combined, other than medical, would be more than the 1 mSv/y (100 mrem/y) limit of subpart D, by submitting an analysis of possible sources of exposure;

(2) Has employed to the extent practical restrictions on site use according to the provisions of §20.1403 in minimizing exposures at the site; and

(3) Reduces doses to ALARA levels, taking into consideration any detriments such as traffic accidents expected to potentially result from decontamination and waste disposal.

(4) Has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating

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the licensee's intent to decommission in accordance with §§30.36(d), 40.42(d), 50.82 (a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee proposes to decommission by use of alternate criteria. The licensee shall document in the decommissioning plan or LTP how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and addressed, as appropriate, following analysis of that advice. In seeking such advice, the licensee shall provide for:

(i) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(ii) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(iii) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement on the issues.

(b) The use of alternate criteria to terminate a license requires the approval of the Commission after consideration of the NRC staff's recommendations that will address any comments provided by the Environmental Protection Agency and any public comments submitted pursuant to §20.1405.

**§ 20.1405 Public notification and public participation.**

Upon the receipt of an LTP or decommissioning plan from the licensee, or a proposal by the licensee for release of a site pursuant to §§20.1403 or 20.1404, or whenever the Commission deems such notice to be in the public interest, the Commission shall:

(a) Notify and solicit comments from:

(1) Local and State governments in the vicinity of the site and any Indian Nation or other indigenous people that have treaty or statutory rights that could be affected by the decommissioning; and

(2) The Environmental Protection Agency for cases where the licensee proposes to release a site pursuant to §20.1404.

(b) Publish a notice in the FEDERAL REGISTER and in a forum, such as local

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newspapers, letters to State of local organizations, or other appropriate forum, that is readily accessible to individuals in the vicinity of the site, and solicit comments from affected parties.

**§ 20.1406 Minimization of contamination.**

(a) Applicants for licenses, other than early site permits and manufacturing licenses under part 52 of this chapter and renewals, whose applications are submitted after August 20, 1997, shall describe in the application how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

(b) Applicants for standard design certifications, standard design approvals, and manufacturing licenses under part 52 of this chapter, whose applications are submitted after August 20, 1997, shall describe in the application how facility design will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

[72 FR 49465, Aug. 28, 2007]

**Subpart F—Surveys and Monitoring**

SOURCE: 56 FR 23398, May 21, 1991, unless otherwise noted.

**§ 20.1501 General.**

(a) Each licensee shall make or cause to be made, surveys that—

(1) May be necessary for the licensee to comply with the regulations in this part; and

(2) Are reasonable under the circumstances to evaluate—

(i) The magnitude and extent of radiation levels; and

(ii) Concentrations or quantities of radioactive material; and

(iii) The potential radiological hazards.

(b) The licensee shall ensure that instruments and equipment used for

quantitative radiation measurements (e.g., dose rate and effluent monitoring) are calibrated periodically for the radiation measured.

(c) All personnel dosimeters (except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to the extremities) that require processing to determine the radiation dose and that are used by licensees to comply with § 20.1201, with other applicable provisions of this chapter, or with conditions specified in a license must be processed and evaluated by a dosimetry processor—

(1) Holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and

(2) Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

[56 FR 23398, May 21, 1991, as amended at 63 FR 39482, July 23, 1998]

**§ 20.1502 Conditions requiring individual monitoring of external and internal occupational dose.**

Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of this part. As a minimum—

(a) Each licensee shall monitor occupational exposure to radiation from licensed and unlicensed radiation sources under the control of the licensee and shall supply and require the use of individual monitoring devices by—

(1) Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the limits in § 20.1201(a),

(2) Minors likely to receive, in 1 year, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv), a lens dose equivalent in excess of 0.15 rem (1.5 mSv), or a shallow dose equivalent to the skin

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or to the extremities in excess of 0.5 rem (5 mSv);

(3) Declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv);<sup>2</sup> and

(4) Individuals entering a high or very high radiation area.

(b) Each licensee shall monitor (see § 20.1204) the occupational intake of radioactive material by and assess the committed effective dose equivalent to—

(1) Adults likely to receive, in 1 year, an intake in excess of 10 percent of the applicable ALI(s) in table 1, columns 1 and 2, of appendix B to §§ 20.1001–20.2402;

(2) Minors likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.1 rem (1 mSv); and

(3) Declared pregnant women likely to receive, during the entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem (1 mSv).

[56 FR 23398, May 21, 1991, as amended at 60 FR 20185, Apr. 25, 1995; 63 FR 39482, July 23, 1998]

### **Subpart G—Control of Exposure From External Sources in Restricted Areas**

SOURCE: 56 FR 23398, May 21, 1991, unless otherwise noted.

#### **§ 20.1601 Control of access to high radiation areas.**

(a) The licensee shall ensure that each entrance or access point to a high radiation area has one or more of the following features—

(1) A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a deep-dose equivalent of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates;

(2) A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor

<sup>2</sup>All of the occupational doses in § 20.1201 continue to be applicable to the declared pregnant worker as long as the embryo/fetus dose limit is not exceeded.

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visor of the activity are made aware of the entry; or

(3) Entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

(b) In place of the controls required by paragraph (a) of this section for a high radiation area, the licensee may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

(c) A licensee may apply to the Commission for approval of alternative methods for controlling access to high radiation areas.

(d) The licensee shall establish the controls required by paragraphs (a) and (c) of this section in a way that does not prevent individuals from leaving a high radiation area.

(e) Control is not required for each entrance or access point to a room or other area that is a high radiation area solely because of the presence of radioactive materials prepared for transport and packaged and labeled in accordance with the regulations of the Department of Transportation provided that—

(1) The packages do not remain in the area longer than 3 days; and

(2) The dose rate at 1 meter from the external surface of any package does not exceed 0.01 rem (0.1 mSv) per hour.

(f) Control of entrance or access to rooms or other areas in hospitals is not required solely because of the presence of patients containing radioactive material, provided that there are personnel in attendance who will take the necessary precautions to prevent the exposure of individuals to radiation or radioactive material in excess of the limits established in this part and to operate within the ALARA provisions of the licensee's radiation protection program.

#### **§ 20.1602 Control of access to very high radiation areas.**

In addition to the requirements in § 20.1601, the licensee shall institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source.

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or any surface through which the radiation penetrates.

**Subpart H—Respiratory Protection and Controls To Restrict Internal Exposure in Restricted Areas**

SOURCE: 56 FR 23400, May 21, 1991, unless otherwise noted.

**§ 20.1701 Use of process or other engineering controls.**

The licensee shall use, to the extent practical, process or other engineering controls (e.g., containment, decontamination, or ventilation) to control the concentration of radioactive material in air.

[64 FR 54556, Oct. 7, 1999]

**§ 20.1702 Use of other controls.**

(a) When it is not practical to apply process or other engineering controls to control the concentrations of radioactive material in the air to values below those that define an airborne radioactivity area, the licensee shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means—

- (1) Control of access;
- (2) Limitation of exposure times;
- (3) Use of respiratory protection equipment; or
- (4) Other controls.

(b) If the licensee performs an ALARA analysis to determine whether or not respirators should be used, the licensee may consider safety factors other than radiological factors. The licensee should also consider the impact of respirator use on workers' industrial health and safety.

[64 FR 54556, Oct. 7, 1999]

**§ 20.1703 Use of individual respiratory protection equipment.**

If the licensee assigns or permits the use of respiratory protection equipment to limit the intake of radioactive material,

(a) The licensee shall use only respiratory protection equipment that is tested and certified by the National Institute for Occupational Safety and

Health (NIOSH) except as otherwise noted in this part.

(b) If the licensee wishes to use equipment that has not been tested or certified by NIOSH, or for which there is no schedule for testing or certification, the licensee shall submit an application to the NRC for authorized use of this equipment except as provided in this part. The application must include evidence that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use. This must be demonstrated either by licensee testing or on the basis of reliable test information.

(c) The licensee shall implement and maintain a respiratory protection program that includes:

(1) Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate doses;

(2) Surveys and bioassays, as necessary, to evaluate actual intakes;

(3) Testing of respirators for operability (user seal check for face sealing devices and functional check for others) immediately prior to each use;

(4) Written procedures regarding—

- (i) Monitoring, including air sampling and bioassays;
- (ii) Supervision and training of respirator users;
- (iii) Fit testing;
- (iv) Respirator selection;
- (v) Breathing air quality;
- (vi) Inventory and control;
- (vii) Storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment;
- (viii) Recordkeeping; and
- (ix) Limitations on periods of respirator use and relief from respirator use;

(5) Determination by a physician that the individual user is medically fit to use respiratory protection equipment:

(i) Before the initial fitting of a face sealing respirator;

(ii) Before the first field use of non-face sealing respirators, and

(iii) Either every 12 months thereafter, or periodically at a frequency determined by a physician.

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(6) Fit testing, with fit factor  $\geq 10$  times the APF for negative pressure devices, and a fit factor  $\geq 500$  for any positive pressure, continuous flow, and pressure-demand devices, before the first field use of tight fitting, face-sealing respirators and periodically thereafter at a frequency not to exceed 1 year. Fit testing must be performed with the facepiece operating in the negative pressure mode.

(d) The licensee shall advise each respirator user that the user may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief.

(e) The licensee shall also consider limitations appropriate to the type and mode of use. When selecting respiratory devices the licensee shall provide for vision correction, adequate communication, low temperature work environments, and the concurrent use of other safety or radiological protection equipment. The licensee shall use equipment in such a way as not to interfere with the proper operation of the respirator.

(f) Standby rescue persons are required whenever one-piece atmosphere-supplying suits, or any combination of supplied air respiratory protection device and personnel protective equipment are used from which an unaided individual would have difficulty extricating himself or herself. The standby persons must be equipped with respiratory protection devices or other apparatus appropriate for the potential hazards. The standby rescue persons shall observe or otherwise maintain continuous communication with the workers (visual, voice, signal line, telephone, radio, or other suitable means), and be immediately available to assist them in case of a failure of the air supply or for any other reason that requires relief from distress. A sufficient number of standby rescue persons must be immediately available to assist all users of this type of equipment and to provide effective emergency rescue if needed.

(g) Atmosphere-supplying respirators must be supplied with respirable air of

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grade D quality or better as defined by the Compressed Gas Association in publication G-7.1, "Commodity Specification for Air," 1997 and included in the regulations of the Occupational Safety and Health Administration (29 CFR 1910.134(i)(1)(ii)(A) through (E)). Grade D quality air criteria include—

(1) Oxygen content (v/v) of 19.5–23.5%;  
(2) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

(3) Carbon monoxide (CO) content of 10 ppm or less;

(4) Carbon dioxide content of 1,000 ppm or less; and

(5) Lack of noticeable odor.

(h) The licensee shall ensure that no objects, materials or substances, such as facial hair, or any conditions that interfere with the face—facepiece seal or valve function, and that are under the control of the respirator wearer, are present between the skin of the wearer's face and the sealing surface of a tight-fitting respirator facepiece.

(i) In estimating the dose to individuals from intake of airborne radioactive materials, the concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the ambient concentration in air without respiratory protection, divided by the assigned protection factor. If the dose is later found to be greater than the estimated dose, the corrected value must be used. If the dose is later found to be less than the estimated dose, the corrected value may be used.

[64 FR 54557, Oct. 7, 1999, as amended at 67 FR 77652, Dec. 19, 2002]

**§ 20.1704 Further restrictions on the use of respiratory protection equipment.**

The Commission may impose restrictions in addition to the provisions of §§ 20.1702, 20.1703, and Appendix A to Part 20, in order to:

(a) Ensure that the respiratory protection program of the licensee is adequate to limit doses to individuals from intakes of airborne radioactive materials consistent with maintaining total effective dose equivalent ALARA; and

(b) Limit the extent to which a licensee may use respiratory protection

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equipment instead of process or other engineering controls.

[64 FR 54557, Oct. 7, 1999]

**§ 20.1705 Application for use of higher assigned protection factors.**

The licensee shall obtain authorization from the Commission before using assigned protection factors in excess of those specified in Appendix A to part 20. The Commission may authorize a licensee to use higher assigned protection factors on receipt of an application that—

(a) Describes the situation for which a need exists for higher protection factors; and

(b) Demonstrates that the respiratory protection equipment provides these higher protection factors under the proposed conditions of use.

[64 FR 54557, Oct. 7, 1999]

**Subpart I—Storage and Control of Licensed Material**

SOURCE: 56 FR 23401, May 21, 1991, unless otherwise noted.

**§ 20.1801 Security of stored material.**

The licensee shall secure from unauthorized removal or access licensed materials that are stored in controlled or unrestricted areas.

**§ 20.1802 Control of material not in storage.**

The licensee shall control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage.

**Subpart J—Precautionary Procedures**

SOURCE: 56 FR 23401, May 21, 1991, unless otherwise noted.

**§ 20.1901 Caution signs.**

(a) *Standard radiation symbol.* Unless otherwise authorized by the Commission, the symbol prescribed by this part shall use the colors magenta, or purple, or black on yellow background. The symbol prescribed by this part is the three-bladed design:

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not exempt from the survey requirement in paragraph (b) of this section for measuring radiation levels that is required to ensure that the source is still properly lodged in its shield.

[56 FR 23401, May 21, 1991, as amended at 57 FR 39357, Aug. 31, 1992; 60 FR 20185, Apr. 25, 1995; 63 FR 39482, July 23, 1998]

**Subpart K—Waste Disposal**

SOURCE: 56 FR 23403, May 21, 1991, unless otherwise noted.

**§ 20.2001 General requirements.**

(a) A licensee shall dispose of licensed material only—

(1) By transfer to an authorized recipient as provided in § 20.2006 or in the regulations in parts 30, 40, 60, 61, 63, 70, and 72 of this chapter;

(2) By decay in storage; or

(3) By release in effluents within the limits in § 20.1301; or

(4) As authorized under §§ 20.2002, 20.2003, 20.2004, 20.2005, or 20.2008.

(b) A person must be specifically licensed to receive waste containing licensed material from other persons for:

(1) Treatment prior to disposal; or

(2) Treatment or disposal by incineration; or

(3) Decay in storage; or

(4) Disposal at a land disposal facility licensed under part 61 of this chapter; or

(5) Disposal at a geologic repository under part 60 or part 63 of this chapter.

[56 FR 23403, May 21, 1991, as amended at 66 FR 55789, Nov. 2, 2001; 72 FR 55922, Oct. 1, 2007]

**§ 20.2002 Method for obtaining approval of proposed disposal procedures.**

A licensee or applicant for a license may apply to the Commission for approval of proposed procedures, not otherwise authorized in the regulations in this chapter, to dispose of licensed material generated in the licensee's activities. Each application shall include:

(a) A description of the waste containing licensed material to be disposed of, including the physical and chemical properties important to risk evaluation, and the proposed manner and conditions of waste disposal; and

(b) An analysis and evaluation of pertinent information on the nature of the environment; and

(c) The nature and location of other potentially affected licensed and unlicensed facilities; and

(d) Analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in this part.

**§ 20.2003 Disposal by release into sanitary sewerage.**

(a) A licensee may discharge licensed material into sanitary sewerage if each of the following conditions is satisfied:

(1) The material is readily soluble (or is readily dispersible biological material) in water; and

(2) The quantity of licensed or other radioactive material that the licensee releases into the sewer in 1 month divided by the average monthly volume of water released into the sewer by the licensee does not exceed the concentration listed in table 3 of appendix B to part 20; and

(3) If more than one radionuclide is released, the following conditions must also be satisfied:

(i) The licensee shall determine the fraction of the limit in table 3 of appendix B to part 20 represented by discharges into sanitary sewerage by dividing the actual monthly average concentration of each radionuclide released by the licensee into the sewer by the concentration of that radionuclide listed in table 3 of appendix B to part 20; and

(ii) The sum of the fractions for each radionuclide required by paragraph (a)(3)(i) of this section does not exceed unity; and

(4) The total quantity of licensed and other radioactive material that the licensee releases into the sanitary sewerage system in a year does not exceed 5 curies (185 GBq) of hydrogen-3, 1 curie (37 GBq) of carbon-14, and 1 curie (37 GBq) of all other radioactive materials combined.

(b) Excreta from individuals undergoing medical diagnosis or therapy with radioactive material are not subject to the limitations contained in paragraph (a) of this section.

[56 FR 23403, May 21, 1991, as amended at 60 FR 20185, Apr. 25, 1995]

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report in preparing the NRC Form 4. For any period in which the licensee does not obtain a report, the licensee shall place a notation on the NRC Form 4 indicating the periods of time for which data are not available.

(e) If the licensee is unable to obtain a complete record of an individual's current and previously accumulated occupational dose, the licensee shall assume—

(1) In establishing administrative controls under § 20.1201(f) for the current year, that the allowable dose limit for the individual is reduced by 1.25 rems (12.5 mSv) for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure; and

(2) That the individual is not available for planned special exposures.

(f) The licensee shall retain the records on NRC Form 4 or equivalent until the Commission terminates each pertinent license requiring this record. The licensee shall retain records used in preparing NRC Form 4 for 3 years after the record is made. This includes records required under the standards for protection against radiation in effect prior to January 1, 1994.

[56 FR 23404, May 21, 1991, as amended at 57 FR 57878, Dec. 8, 1992; 60 FR 20186, Apr. 25, 1995; 60 FR 36043, July 13, 1995; 72 FR 68059, Dec. 4, 2007]

**§ 20.2105 Records of planned special exposures.**

(a) For each use of the provisions of § 20.1206 for planned special exposures, the licensee shall maintain records that describe—

(1) The exceptional circumstances requiring the use of a planned special exposure; and

(2) The name of the management official who authorized the planned special exposure and a copy of the signed authorization; and

(3) What actions were necessary; and

(4) Why the actions were necessary; and

(5) How doses were maintained ALARA; and

(6) What individual and collective doses were expected to result, and the doses actually received in the planned special exposure.

(b) The licensee shall retain the records until the Commission terminates each pertinent license requiring these records.

**§ 20.2106 Records of individual monitoring results.**

(a) *Recordkeeping requirement.* Each licensee shall maintain records of doses received by all individuals for whom monitoring was required pursuant to § 20.1502, and records of doses received during planned special exposures, accidents, and emergency conditions. These records<sup>5</sup> must include, when applicable—

(1) The deep-dose equivalent to the whole body, lens dose equivalent, shallow-dose equivalent to the skin, and shallow-dose equivalent to the extremities;

(2) The estimated intake of radionuclides (see § 20.1202);

(3) The committed effective dose equivalent assigned to the intake of radionuclides;

(4) The specific information used to assess the committed effective dose equivalent pursuant to § 20.1204 (a) and (c), and when required by § 20.1502;

(5) The total effective dose equivalent when required by § 20.1202; and

(6) The total of the deep-dose equivalent and the committed dose to the organ receiving the highest total dose.

(b) *Recordkeeping frequency.* The licensee shall make entries of the records specified in paragraph (a) of this section at least annually.

(c) *Recordkeeping format.* The licensee shall maintain the records specified in paragraph (a) of this section on NRC Form 5, in accordance with the instructions for NRC Form 5, or in clear and legible records containing all the information required by NRC Form 5.

(d) *Privacy protection.* The records required under this section should be protected from public disclosure because of their personal privacy nature. These records are protected by most State privacy laws and, when transferred to the NRC, are protected by the Privacy Act of 1974, Public Law 93-579, 5 U.S.C.

<sup>5</sup> Assessments of dose equivalent and records made using units in effect before the licensee's adoption of this part need not be changed.

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of one occupational annual limit on intake (the provisions of this paragraph do not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures).

(c) The licensee shall prepare any report filed with the Commission pursuant to this section so that names of individuals who have received exposure to radiation or radioactive material are stated in a separate and detachable part of the report.

(d) Reports made by licensees in response to the requirements of this section must be made as follows:

(1) Licensees having an installed Emergency Notification System shall make the reports required by paragraphs (a) and (b) of this section to the NRC Operations Center in accordance with 10 CFR 50.72; and

(2) All other licensees shall make the reports required by paragraphs (a) and (b) of this section by telephone to the NRC Operations Center (301) 816-5100.

(e) The provisions of this section do not include doses that result from planned special exposures, that are within the limits for planned special exposures, and that are reported under § 20.2204.

[56 FR 23406, May 21, 1991, as amended at 56 FR 40766, Aug. 16, 1991; 57 FR 57879, Dec. 8, 1992; 59 FR 14086, Mar. 25, 1994; 63 FR 39483, July 23, 1998]

**§ 20.2203 Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits.**

(a) *Reportable events.* In addition to the notification required by § 20.2202, each licensee shall submit a written report within 30 days after learning of any of the following occurrences:

(1) Any incident for which notification is required by § 20.2202; or

(2) Doses in excess of any of the following:

(i) The occupational dose limits for adults in § 20.1201; or

(ii) The occupational dose limits for a minor in § 20.1207; or

(iii) The limits for an embryo/fetus of a declared pregnant woman in § 20.1208; or

(iv) The limits for an individual member of the public in § 20.1301; or

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(v) Any applicable limit in the license; or

(vi) The ALARA constraints for air emissions established under § 20.1101(d); or

(3) Levels of radiation or concentrations of radioactive material in—

(i) A restricted area in excess of any applicable limit in the license; or

(ii) An unrestricted area in excess of 10 times any applicable limit set forth in this part or in the license (whether or not involving exposure of any individual in excess of the limits in § 20.1301); or

(4) For licensees subject to the provisions of EPA's generally applicable environmental radiation standards in 40 CFR part 190, levels of radiation or releases of radioactive material in excess of those standards, or of license conditions related to those standards.

(b) *Contents of reports.* (1) Each report required by paragraph (a) of this section must describe the extent of exposure of individuals to radiation and radioactive material, including, as appropriate:

(i) Estimates of each individual's dose; and

(ii) The levels of radiation and concentrations of radioactive material involved; and

(iii) The cause of the elevated exposures, dose rates, or concentrations; and

(iv) Corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, ALARA constraints, generally applicable environmental standards, and associated license conditions.

(2) Each report filed pursuant to paragraph (a) of this section must include for each occupationally overexposed<sup>1</sup> individual: the name, Social Security account number, and date of birth. The report must be prepared so that this information is stated in a separate and detachable part of the report and must be clearly labeled "Privacy Act Information: Not for Public Disclosure."

<sup>1</sup>With respect to the limit for the embryo/fetus (§ 20.1208), the identifiers should be those of the declared pregnant woman.

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(c) For holders of an operating license or a combined license for a nuclear power plant, the occurrences included in paragraph (a) of this section must be reported in accordance with the procedures described in §§50.73(b), (c), (d), (e), and (g) of this chapter, and must include the information required by paragraph (b) of this section. Occurrences reported in accordance with §50.73 of this chapter need not be reported by a duplicate report under paragraph (a) of this section.

(d) All licensees, other than those holding an operating license or a combined license for a nuclear power plant, who make reports under paragraph (a) of this section shall submit the report in writing either by mail addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; by hand delivery to the NRC's offices at 11555 Rockville Pike, Rockville, Maryland; or, where practicable, by electronic submission, for example, Electronic Information Exchange, or CD-ROM. Electronic submissions must be made in a manner that enables the NRC to receive, read, authenticate, distribute, and archive the submission, and process and retrieve it a single page at a time. Detailed guidance on making electronic submissions can be obtained by visiting the NRC's Web site at <http://www.nrc.gov/site-help/e-submittals.html>; by e-mail to [MSHD.Resource@nrc.gov](mailto:MSHD.Resource@nrc.gov); or by writing the Office of Information Services, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. A copy should be sent to the appropriate NRC Regional Office listed in appendix D to this part.

[56 FR 23406, May 21, 1991, as amended at 60 FR 20186, Apr. 25, 1995; 61 FR 65127, Dec. 10, 1996; 68 FR 14308a, Mar. 25, 2003; 68 FR 58801, Oct. 10, 2003; 72 FR 49486, Aug. 28, 2007; 74 FR 62680, Dec. 1, 2009]

**§ 20.2204 Reports of planned special exposures.**

The licensee shall submit a written report to the Administrator of the appropriate NRC Regional Office listed in appendix D to part 20 within 30 days following any planned special exposure conducted in accordance with §20.1206, informing the Commission that a planned special exposure was con-

ducted and indicating the date the planned special exposure occurred and the information required by §20.2105.

[56 FR 23406, May 21, 1991, as amended at 60 FR 20186, Apr. 25, 1995]

**§ 20.2205 Reports to individuals of exceeding dose limits.**

When a licensee is required by §§20.2203 or 20.2204 to report to the Commission any exposure of an identified occupationally exposed individual, or an identified member of the public, to radiation or radioactive material, the licensee shall also provide the individual a report on his or her exposure data included in the report to Commission. This report must be transmitted no later than the transmittal to the Commission.

[72 FR 68059, Dec. 4, 2007]

**§ 20.2206 Reports of individual monitoring.**

(a) This section applies to each person licensed by the Commission to—

(1) Operate a nuclear reactor designed to produce electrical or heat energy pursuant to §50.21(b) or §50.22 of this chapter or a testing facility as defined in §50.2 of this chapter; or

(2) Possess or use byproduct material for purposes of radiography pursuant to parts 30 and 34 of this chapter; or

(3) Possess or use at any one time, for purposes of fuel processing, fabricating, or reprocessing, special nuclear material in a quantity exceeding 5,000 grams of contained uranium-235, uranium-233, or plutonium, or any combination thereof pursuant to part 70 of this chapter; or

(4) Possess high-level radioactive waste at a geologic repository operations area pursuant to part 60 or 63 of this chapter; or

(5) Possess spent fuel in an independent spent fuel storage installation (ISFSI) pursuant to part 72 of this chapter; or

(6) Receive radioactive waste from other persons for disposal under part 61 of this chapter; or

(7) Possess or use at any time, for processing or manufacturing for distribution pursuant to parts 30, 32, 33 or 35 of this chapter, byproduct material

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part are in addition to, and not in substitution for, other requirements of this chapter. In particular, the requirements and provisions of 10 parts 19, 20, 21, 30, 71, 150, 170, and 171 of this chapter apply to applications and licenses subject to this part. This rule does not apply to medical uses of byproduct material.

## §34.3 Definitions.

*ALARA* (acronym for "as low as is reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits specified in 10 CFR part 20 as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

*Annual refresher safety training* means a review conducted or provided by the licensee for its employees on radiation safety aspects of industrial radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, new or revised regulations, accidents or errors that have been observed, and should also provide opportunities for employees to ask safety questions.

*Associated equipment* means equipment that is used in conjunction with a radiographic exposure device to make radiographic exposures that drives, guides, or comes in contact with the source, (e.g., guide tube, control tube, control (drive) cable, removable source stop, "J" tube and collimator when it is used as an exposure head.

*Becquerel (Bq)* means one disintegration per second.

*Certifying Entity* means an independent certifying organization meeting the requirements in appendix A of this part or an Agreement State meeting the requirements in appendix A, parts II and III of this part.

*Collimator* means a radiation shield that is placed on the end of the guide

tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.

*Control (drive) cable* means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

*Control drive mechanism* means a device that enables the source assembly to be moved to and from the exposure device.

*Control tube* means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

*Exposure head* means a device that locates the gamma radiography sealed source in the selected working position. (An exposure head is also known as a source stop.)

*Field station* means a facility where licensed material may be stored or used and from which equipment is dispatched.

*Gray* means the SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 Joule/kilogram. It is also equal to 100 rads.

*Guide tube (Projection sheath)* means a flexible or rigid tube (i.e., "J" tube) for guiding the source assembly and the attached control cable from the exposure device to the exposure head. The guide tube may also include the connections necessary for attachment to the exposure device and to the exposure head.

*Hands-on experience* means experience in all of those areas considered to be directly involved in the radiography process.

*Independent certifying organization* means an independent organization that meets all of the criteria of appendix A to this part.

*Industrial radiography (radiography)* means an examination of the structure of materials by nondestructive methods, utilizing ionizing radiation to make radiographic images.

*Lay-barge radiography* means industrial radiography performed on any water vessel used for laying pipe.

*Offshore platform radiography* means industrial radiography conducted from a platform over a body of water.

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*Permanent radiographic installation* means an enclosed shielded room, cell, or vault, not located at a temporary jobsite, in which radiography is performed.

*Practical Examination* means a demonstration through practical application of the safety rules and principles in industrial radiography including use of all appropriate equipment and procedures.

*Radiation Safety Officer for industrial radiography* means an individual with the responsibility for the overall radiation safety program on behalf of the licensee and who meets the requirements of §34.42.

*Radiographer* means any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises industrial radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of the Commission's regulations and the conditions of the license.

*Radiographer certification* means written approval received from a certifying entity stating that an individual has satisfactorily met certain established radiation safety, testing, and experience criteria.

*Radiographer's assistant* means any individual who under the direct supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in industrial radiography.

*Radiographic exposure device* (also called a camera, or a projector) means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure.

*Radiographic operations* means all activities associated with the presence of radioactive sources in a radiographic exposure device during use of the device or transport (except when being transported by a common or contract transport), to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

*S-tube* means a tube through which the radioactive source travels when inside a radiographic exposure device.

*Sealed source* means any byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material.

*Shielded position* means the location within the radiographic exposure device or source changer where the sealed source is secured and restricted from movement.

*Sievert* means the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (1 Sv = 100 rems).

*Source assembly* means an assembly that consists of the sealed source and a connector that attaches the source to the control cable. The source assembly may also include a stop ball used to secure the source in the shielded position.

*Source changer* means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those also used for transporting and storage of sealed sources.

*Storage area* means any location, facility, or vehicle which is used to store or to secure a radiographic exposure device, a storage container, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with, or unauthorized removal of the device, container, or source.

*Storage container* means a container in which sealed sources are secured and stored.

*Temporary jobsite* means a location where radiographic operations are conducted and where licensed material may be stored other than those location(s) of use authorized on the license.

*Underwater radiography* means industrial radiography performed when the radiographic exposure device and/or related equipment are beneath the surface of the water.

**Nuclear Regulatory Commission****§ 34.43****§ 34.42 Radiation Safety Officer for industrial radiography.**

The RSO shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's program.

(a) The minimum qualifications, training, and experience for RSOs for industrial radiography are as follows:

(1) Completion of the training and testing requirements of § 34.43(a);

(2) 2000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and

(3) Formal training in the establishment and maintenance of a radiation protection program.

(b) The Commission will consider alternatives when the RSO has appropriate training and/or experience in the field of ionizing radiation, and in addition, has adequate formal training with respect to the establishment and maintenance of a radiation safety protection program.

(c) The specific duties and authorities of the RSO include, but are not limited to:

(1) Establishing and overseeing all operating, emergency, and ALARA procedures as required by 10 CFR part 20 of this chapter, and reviewing them regularly to ensure that the procedures in use conform to current 10 CFR part 20 procedures, conform to other NRC regulations and to the license conditions.

(2) Overseeing and approving all phases of the training program for radiographic personnel, ensuring that appropriate and effective radiation protection practices are taught;

(3) Ensuring that required radiation surveys and leak tests are performed and documented in accordance with the regulations, including any corrective measures when levels of radiation exceed established limits;

(4) Ensuring that personnel monitoring devices are calibrated and used properly by occupationally-exposed personnel, that records are kept of the monitoring results, and that timely notifications are made as required by § 20.2203 of this chapter; and

(5) Ensuring that operations are conducted safely and to assume control for

instituting corrective actions including stopping of operations when necessary.

(d) Licensees will have until June 27, 1999, to meet the requirements of paragraph (a) or (b) of this section.

[62 FR 28963, May 28, 1997, as amended at 63 FR 37061, July 9, 1998]

**§ 34.43 Training.**

(a) The licensee may not permit any individual to act as a radiographer until the individual—

(1) Has received training in the subjects in paragraph (g) of this section, in addition to a minimum of 2 months of on-the-job training, and is certified through a radiographer certification program by a certifying entity in accordance with the criteria specified in appendix A of this part. (An independent organization that would like to be recognized as a certifying entity shall submit its request to the Director, Office of Federal and State Materials and Environmental Management Programs, by an appropriate method listed in § 30.6(a) of this chapter.); or

(2) The licensee may, until June 27, 1999, allow an individual who has not met the requirements of paragraph (a)(1) of this section, to act as a radiographer after the individual has received training in the subjects outlined in paragraph (g) of this section and demonstrated an understanding of these subjects by successful completion of a written examination that was previously submitted to and approved by the Commission.

(b) In addition, the licensee may not permit any individual to act as a radiographer until the individual—

(1) Has received copies of and instruction in the requirements described in NRC regulations contained in this part; in §§ 30.7, 30.9, and 30.10 of this chapter; in the applicable sections of 10 CFR parts 19 and 20, of this chapter, in applicable DOT regulations as referenced in 10 CFR part 71, in the NRC license(s) under which the radiographer will perform industrial radiography, and the licensee's operating and emergency procedures;

(2) Has demonstrated understanding of the licensee's license and operating

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(i) Sections 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Atomic Energy Act of 1954, as amended;

(ii) Section 206 of the Energy Reorganization Act;

(iii) Any rule, regulation, or order issued pursuant to the sections specified in paragraph (b)(1)(i) of this section;

(iv) Any term, condition, or limitation of any license issued under the sections specified in paragraph (b)(1)(i) of this section.

(2) For any violation for which a license may be revoked under section 186 of the Atomic Energy Act of 1954, as amended.

[57 FR 55074, Nov. 24, 1992]

**§ 39.103 Criminal penalties.**

(a) Section 223 of the Atomic Energy Act of 1954, as amended, provides for criminal sanctions for willful violation of, attempted violation of, or conspiracy to violate, any regulation issued under sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in part 39 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in part 39 that are not issued under sections 161b, 161i, or 161o for the purposes of section 223 are as follows: §§ 39.1, 39.2, 39.5, 39.8, 39.13, 39.91, 39.101, and 39.103.

[57 FR 55074, Nov. 24, 1992]

**PART 40—DOMESTIC LICENSING OF SOURCE MATERIAL****GENERAL PROVISIONS**

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**APPENDIX A TO PART 40—CRITERIA RELATING TO THE OPERATION OF URANIUM MILLS AND THE DISPOSITION OF TAILINGS OR WASTES PRODUCED BY THE EXTRACTION OR CONCENTRATION OF SOURCE MATERIAL FROM ORES PROCESSED PRIMARILY FROM THEIR SOURCE MATERIAL CONTENT**

**AUTHORITY:** Secs. 62, 63, 64, 65, 81, 161, 182, 183, 186, 68 Stat. 932, 933, 935, 948, 953, 954, 955, as amended, secs. 11e(2), 83, 84, Pub. L. 95-604, 92 Stat. 3033, as amended, 3039, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2014(e)(2), 2092, 2093, 2094, 2095, 2111, 2113, 2114, 2201, 2232, 2233, 2236, 2282); sec. 274, Pub. L. 96-373, 73 Stat. 688 (42 U.S.C. 2021); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 275, 92 Stat. 3021, as amended by Pub. L. 97-415, 96 Stat. 2067 (42 U.S.C. 2022); sec. 193, 104 Stat. 2835, as amended by Pub. L. 104-134, 110 Stat. 1321, 1321-349 (42 U.S.C. 2243); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note); Energy Policy Act of 2005, Pub. L. No. 109-59, 119 Stat. 594 (2005). Section 40.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 40.31(g) also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 40.71 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

**SOURCE:** 26 FR 284, Jan. 14, 1961, unless otherwise noted.

**GENERAL PROVISIONS****§ 40.1 Purpose.**

(a) The regulations in this part establish procedures and criteria for the issuance of licenses to receive title to, receive, possess, use, transfer, or deliver source and byproduct materials, as defined in this part, and establish and provide for the terms and conditions upon which the Commission will issue such licenses. (Additional re-

quirements applicable to natural and depleted uranium at enrichment facilities are set forth in § 70.22 of this chapter.) These regulations also provide for the disposal of byproduct material and for the long-term care and custody of byproduct material and residual radioactive material. The regulations in this part also establish certain requirements for the physical protection of import, export, and transient shipments of natural uranium. (Additional requirements applicable to the import and export of natural uranium are set forth in part 110 of this chapter.)

(b) The regulations contained in this part are issued under the Atomic Energy Act of 1954, as amended (68 Stat. 919), title II of the Energy Reorganization Act of 1974, as amended (88 Stat. 1242), and titles I and II of the Uranium Mill Tailings Radiation Control Act of 1978, as amended (42 U.S.C. 7901).

[55 FR 45597, Oct. 30, 1990, as amended at 56 FR 55997, Oct. 31, 1991]

**§ 40.2 Scope.**

Except as provided in §§ 40.11 to 40.14, inclusive, the regulations in this part apply to all persons in the United States. This part also gives notice to all persons who knowingly provide to any licensee, applicant, contractor, or subcontractor, components, equipment, materials, or other goods or services, that relate to a licensee's or applicant's activities subject to this part, that they may be individually subject to NRC enforcement action for violation of § 40.10.

[63 FR 1896, Jan. 13, 1998]

**§ 40.2a Coverage of inactive tailings sites.**

(a) Prior to the completion of the remedial action, the Commission will not require a license pursuant to 10 CFR chapter I for possession of residual radioactive materials as defined in this part that are located at a site where milling operations are no longer active, if the site is covered by the remedial action program of title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The Commission will exert its regulatory role in remedial actions primarily through concurrence and consultation in the

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40.20, 40.21, 40.31, 40.32, 40.34, 40.43, 40.44, 40.45, 40.71, 40.81, and 40.82.

[57 FR 55075, Nov. 24, 1992]

APPENDIX A TO PART 40—CRITERIA RELATING TO THE OPERATION OF URANIUM MILLS AND THE DISPOSITION OF TAILINGS OR WASTES PRODUCED BY THE EXTRACTION OR CONCENTRATION OF SOURCE MATERIAL FROM ORES PROCESSED PRIMARILY FOR THEIR SOURCE MATERIAL CONTENT

*Introduction.* Every applicant for a license to possess and use source material in conjunction with uranium or thorium milling, or byproduct material at sites formerly associated with such milling, is required by the provisions of §40.31(h) to include in a license application proposed specifications relating to milling operations and the disposition of tailings or wastes resulting from such milling activities. This appendix establishes technical, financial, ownership, and long-term site surveillance criteria relating to the siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at which such mills and systems are located. As used in this appendix, the term "as low as is reasonably achievable" has the same meaning as in §20.1003 of this chapter.

In many cases, flexibility is provided in the criteria to allow achieving an optimum tailings disposal program on a site-specific basis. However, in such cases the objectives, technical alternatives and concerns which must be taken into account in developing a tailings program are identified. As provided by the provisions of §40.31(h) applications for licenses must clearly demonstrate how the criteria have been addressed.

The specifications must be developed considering the expected full capacity of tailings or waste systems and the lifetime of mill operations. Where later expansions of systems or operations may be likely (for example, where large quantities of ore now marginally uneconomical may be stockpiled), the amenability of the disposal system to accommodate increased capacities without degradation in long-term stability and other performance factors must be evaluated.

Licensees or applicants may propose alternatives to the specific requirements in this appendix. The alternative proposals may take into account local or regional conditions, including geology, topography, hydrology, and meteorology. The Commission may find that the proposed alternatives meet the Commission's requirements if the alternatives will achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safe-

ty, and the environment from radiological and nonradiological hazards associated with the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR part 192, subparts D and E.

All site specific licensing decisions based on the criteria in this appendix or alternatives proposed by licensees or applicants will take into account the risk to the public health and safety and the environment with due consideration to the economic costs involved and any other factors the Commission determines to be appropriate. In implementing this appendix, the Commission will consider "practicable" and "reasonably achievable" as equivalent terms. Decisions involved these terms will take into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest.

The following definitions apply to the specified terms as used in this appendix:

*Aquifer* means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs. Any saturated zone created by uranium or thorium recovery operations would not be considered an aquifer unless the zone is or potentially is (1) hydraulically interconnected to a natural aquifer, (2) capable of discharge to surface water, or (3) reasonably accessible because of migration beyond the vertical projection of the boundary of the land transferred for long-term government ownership and care in accordance with Criterion 11 of this appendix.

*As expeditiously as practicable considering technological feasibility*, for the purposes of Criterion 6A, means as quickly as possible considering: the physical characteristics of the tailings and the site; the limits of *available technology*; the need for consistency with mandatory requirements of other regulatory programs; and *factors beyond the control of the licensee*. The phrase permits consideration of the cost of compliance only to the extent specifically provided for by use of the term *available technology*.

*Available technology* means technologies and methods for emplacing a final radon barrier on uranium mill tailings piles or impoundments. This term shall not be construed to include extraordinary measures or techniques that would impose costs that are grossly excessive as measured by practice within the industry (or one that is reasonably analogous), (such as, by way of illustration only, unreasonable overtime, staffing, or transportation requirements, etc., considering normal practice in the industry; laser

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fusion of soils, etc.), provided there is reasonable progress toward emplacement of the final radon barrier. To determine grossly excessive costs, the relevant baseline against which cost shall be compared is the cost estimate for tailings impoundment closure contained in the licensee's approved reclamation plan, but costs beyond these estimates shall not automatically be considered grossly excessive.

*Closure* means the activities following operations to decontaminate and decommission the buildings and site used to produce byproduct materials and reclaim the tailings and/or waste disposal area.

*Closure plan* means the Commission approved plan to accomplish closure.

*Compliance period* begins when the Commission sets secondary ground-water protection standards and ends when the owner or operator's license is terminated and the site is transferred to the State or Federal agency for long-term care.

*Dike* means an embankment or ridge of either natural or man-made materials used to prevent the movement of liquids, sludges, solids or other materials.

*Disposal area* means the area containing byproduct materials to which the requirements of Criterion 6 apply.

*Existing portion* means that land surface area of an existing surface impoundment on which significant quantities of uranium or thorium byproduct materials had been placed prior to September 30, 1983.

*Factors beyond the control of the licensee* means factors proximately causing delay in meeting the schedule in the applicable reclamation plan for the timely emplacement of the final radon barrier notwithstanding the good faith efforts of the licensee to complete the barrier in compliance with paragraph (1) of Criterion 6A. These factors may include, but are not limited to—

- (1) Physical conditions at the site;
- (2) Inclement weather or climatic conditions;
- (3) An act of God;
- (4) An act of war;
- (5) A judicial or administrative order or decision, or change to the statutory, regulatory, or other legal requirements applicable to the licensee's facility that would preclude or delay the performance of activities required for compliance;
- (6) Labor disturbances;
- (7) Any modifications, cessation or delay ordered by State, Federal, or local agencies;
- (8) Delays beyond the time reasonably required in obtaining necessary government permits, licenses, approvals, or consent for activities described in the reclamation plan proposed by the licensee that result from agency failure to take final action after the licensee has made a good faith, timely effort to submit legally sufficient applications, responses to requests (including relevant data

requested by the agencies), or other information, including approval of the reclamation plan; and

(9) An act or omission of any third party over whom the licensee has no control.

*Final radon barrier* means the earthen cover (or approved alternative cover) over tailings or waste constructed to comply with Criterion 6 of this appendix (excluding erosion protection features).

*Ground water* means water below the land surface in a zone of saturation. For purposes of this appendix, ground water is the water contained within an aquifer as defined above.

*Leachate* means any liquid, including any suspended or dissolved components in the liquid, that has percolated through or drained from the byproduct material.

*Licensed site* means the area contained within the boundary of a location under the control of persons generating or storing byproduct materials under a Commission license.

*Liner* means a continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment which restricts the downward or lateral escape of byproduct material, hazardous constituents, or leachate.

*Milestone* means an action or event that is required to occur by an enforceable date.

*Operation* means that a uranium or thorium mill tailings pile or impoundment is being used for the continued placement of byproduct material or is in standby status for such placement. A pile or impoundment is in operation from the day that byproduct material is first placed in the pile or impoundment until the day final closure begins.

*Point of compliance* is the site specific location in the uppermost aquifer where the ground-water protection standard must be met.

*Reclamation plan*, for the purposes of Criterion 6A, means the plan detailing activities to accomplish reclamation of the tailings or waste disposal area in accordance with the technical criteria of this appendix. The reclamation plan must include a schedule for reclamation milestones that are key to the completion of the final radon barrier including as appropriate, but not limited to, wind blown tailings retrieval and placement on the pile, interim stabilization (including dewatering or the removal of freestanding liquids and recontouring), and final radon barrier construction. (Reclamation of tailings must also be addressed in the closure plan; the detailed reclamation plan may be incorporated into the closure plan.)

*Surface impoundment* means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well.

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*Uppermost aquifer* means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.

## I. TECHNICAL CRITERIA

*Criterion 1*—The general goal or broad objective in siting and design decisions is permanent isolation of tailings and associated contaminants by minimizing disturbance and dispersion by natural forces, and to do so without ongoing maintenance. For practical reasons, specific siting decisions and design standards must involve finite times (e.g., the longevity design standard in Criterion 6). The following site features which will contribute to such a goal or objective must be considered in selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites:

Remoteness from populated areas;

Hydrologic and other natural conditions as they contribute to continued immobilization and isolation of contaminants from ground-water sources; and

Potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term.

The site selection process must be an optimization to the maximum extent reasonably achievable in terms of these features.

In the selection of disposal sites, primary emphasis must be given to isolation of tailings or wastes, a matter having long-term impacts, as opposed to consideration only of short-term convenience or benefits, such as minimization of transportation or land acquisition costs. While isolation of tailings will be a function of both site and engineering design, overriding consideration must be given to siting features given the long-term nature of the tailings hazards.

Tailings should be disposed of in a manner that no active maintenance is required to preserve conditions of the site.

*Criterion 2*—To avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations must be disposed of at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity, and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

*Criterion 3*—The "prime option" for disposal of tailings is placement below grade, either in mines or specially excavated pits (that is,

where the need for any specially constructed retention structure is eliminated). The evaluation of alternative sites and disposal methods performed by mill operators in support of their proposed tailings disposal program (provided in applicants' environmental reports) must reflect serious consideration of this disposal mode. In some instances, below grade disposal may not be the most environmentally sound approach, such as might be the case if a ground-water formation is relatively close to the surface or not very well isolated by overlying soils and rock. Also, geologic and topographic conditions might make full below grade burial impracticable: For example, bedrock may be sufficiently near the surface that blasting would be required to excavate a disposal pit at excessive cost, and more suitable alternative sites are not available. Where full below grade burial is not practicable, the size of retention structures, and size and steepness of slopes associated exposed embankments must be minimized by excavation to the maximum extent reasonably achievable or appropriate given the geologic and hydrologic conditions at a site. In these cases, it must be demonstrated that an above grade disposal program will provide reasonably equivalent isolation of the tailings from natural erosional forces.

*Criterion 4*—The following site and design criteria must be adhered to whether tailings or wastes are disposed of above or below grade.

(a) Upstream rainfall catchment areas must be minimized to decrease erosion potential and the size of the floods which could erode or wash out sections of the tailings disposal area.

(b) Topographic features should provide good wind protection.

(c) Embankment and cover slopes must be relatively flat after final stabilization to minimize erosion potential and to provide conservative factors of safety assuring long-term stability. The broad objective should be to contour final slopes to grades which are as close as possible to those which would be provided if tailings were disposed of below grade; this could, for example, lead to slopes of about 10 horizontal to 1 vertical (10h:1v) or less steep. In general, slopes should not be steeper than about 5h:1v. Where steeper slopes are proposed, reasons why a slope less steep than 5h:1v would be impracticable should be provided, and compensating factors and conditions which make such slopes acceptable should be identified.

(d) A full self-sustaining vegetative cover must be established or rock cover employed to reduce wind and water erosion to negligible levels.

Where a full vegetative cover is not likely to be self-sustaining due to climatic or other conditions, such as in semi-arid and arid regions, rock cover must be employed on

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slopes of the impoundment system. The NRC will consider relaxing this requirement for extremely gentle slopes such as those which may exist on the top of the pile.

The following factors must be considered in establishing the final rock cover design to avoid displacement of rock particles by human and animal traffic or by natural process, and to preclude undercutting and piping:

Shape, size, composition, and gradation of rock particles (excepting bedding material average particles size must be at least cobble size or greater);

Rock cover thickness and zoning of particles by size; and

Steepness of underlying slopes.

Individual rock fragments must be dense, sound, and resistant to abrasion, and must be free from cracks, seams, and other defects that would tend to unduly increase their destruction by water and frost actions. Weak, friable, or laminated aggregate may not be used.

Rock covering of slopes may be unnecessary where top covers are very thick (or less); bulk cover materials have inherently favorable erosion resistance characteristics; and, there is negligible drainage catchment area upstream of the pile and good wind protection as described in points (a) and (b) of this Criterion.

Furthermore, all impoundment surfaces must be contoured to avoid areas of concentrated surface runoff or abrupt or sharp changes in slope gradient. In addition to rock cover on slopes, areas toward which surface runoff might be directed must be well protected with substantial rock cover (rip rap). In addition to providing for stability of the impoundment system itself, overall stability, erosion potential, and geomorphology of surrounding terrain must be evaluated to assure that there are not ongoing or potential processes, such as gully erosion, which would lead to impoundment instability.

(e) The impoundment may not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand. As used in this criterion, the term "capable fault" has the same meaning as defined in section III(g) of appendix A of 10 CFR part 100. The term "maximum credible earthquake" means that earthquake which would cause the maximum vibratory ground motion based upon an evaluation of earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material.

(f) The impoundment, where feasible, should be designed to incorporate features which will promote deposition. For example, design features which promote deposition of sediment suspended in any runoff which flows into the impoundment area might be

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utilized; the object of such a design feature would be to enhance the thickness of cover over time.

*Criterion 5*—Criteria 5A-5D and new Criterion 13 incorporate the basic ground-water protection standards imposed by the Environmental Protection Agency in 40 CFR part 192, subparts D and E (48 FR 45926; October 7, 1983) which apply during operations and prior to the end of closure. Ground-water monitoring to comply with these standards is required by Criterion 7A.

5A(1)—The primary ground-water protection standard is a design standard for surface impoundments used to manage uranium and thorium byproduct material. Unless exempted under paragraph 5A(3) of this criterion, surface impoundments (except for an existing portion) must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, ground water, or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil, ground water, or surface water) during the active life of the facility, provided that impoundment closure includes removal or decontamination of all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate. For impoundments that will be closed with the liner material left in place, the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility.

5A(2)—The liner required by paragraph 5A(1) above must be—

(a) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

(b) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(c) Installed to cover all surrounding earth likely to be in contact with the wastes or leachate.

5A(3)—The applicant or licensee will be exempted from the requirements of paragraph 5A(1) of this criterion if the Commission finds, based on a demonstration by the applicant or licensee, that alternate design and operating practices, including the closure plan, together with site characteristics will

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prevent the migration of any hazardous constituents into ground water or surface water at any future time. In deciding whether to grant an exemption, the Commission will consider—

(a) The nature and quantity of the wastes;  
(b) The proposed alternate design and operation;

(c) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the impoundment and ground water or surface water; and

(d) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.

5A(4)—A surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations, overfilling, wind and wave actions, rainfall, or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error.

5A(5)—When dikes are used to form the surface impoundment, the dikes must be designed, constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the impoundment.

5B(1)—Uranium and thorium byproduct materials must be managed to conform to the following secondary ground-water protection standard: Hazardous constituents entering the ground water from a licensed site must not exceed the specified concentration limits in the uppermost aquifer beyond the point of compliance during the compliance period. Hazardous constituents are those constituents identified by the Commission pursuant to paragraph 5B(2) of this criterion. Specified concentration limits are those limits established by the Commission as indicated in paragraph 5B(5) of this criterion. The Commission will also establish the point of compliance and compliance period on a site specific basis through license conditions and orders. The objective in selecting the point of compliance is to provide the earliest practicable warning that the impoundment is releasing hazardous constituents to the ground water. The point of compliance must be selected to provide prompt indication of ground-water contamination on the hydraulically downgradient edge of the disposal area. The Commission shall identify hazardous constituents, establish concentration limits, set the compliance period, and may adjust the point of compliance if needed to accord with developed data and site information as to the flow of ground water or contaminants, when the detection monitoring established under Criterion 7A indicates

leakage of hazardous constituents from the disposal area.

5B(2)—A constituent becomes a hazardous constituent subject to paragraph 5B(5) only when the constituent meets all three of the following tests:

(a) The constituent is reasonably expected to be in or derived from the byproduct material in the disposal area;

(b) The constituent has been detected in the ground water in the uppermost aquifer; and

(c) The constituent is listed in Criterion 13 of this appendix.

5B(3)—Even when constituents meet all three tests in paragraph 5B(2) of this criterion, the Commission may exclude a detected constituent from the set of hazardous constituents on a site specific basis if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment. In deciding whether to exclude constituents, the Commission will consider the following:

(a) Potential adverse effects on ground-water quality, considering—

(i) The physical and chemical characteristics of the waste in the licensed site, including its potential for migration;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity of ground water and the direction of ground-water flow;

(iv) The proximity and withdrawal rates of ground-water users;

(v) The current and future uses of ground water in the area;

(vi) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground-water quality;

(vii) The potential for health risks caused by human exposure to waste constituents;

(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(ix) The persistence and permanence of the potential adverse effects.

(b) Potential adverse effects on hydraulically-connected surface water quality, considering—

(i) The volume and physical and chemical characteristics of the waste in the licensed site;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity and quality of ground water, and the direction of ground-water flow;

(iv) The patterns of rainfall in the region;

(v) The proximity of the licensed site to surface waters;

(vi) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;

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(vii) The existing quality of surface water, including other sources of contamination and the cumulative impact on surface-water quality;

(viii) The potential for health risks caused by human exposure to waste constituents;

(ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

(x) The persistence and permanence of the potential adverse effects.

5B(4)—In making any determinations under paragraphs 5B(3) and 5B(6) of this criterion about the use of ground water in the area around the facility, the Commission will consider any identification of underground sources of drinking water and exempted aquifers made by the Environmental Protection Agency.

5B(5)—At the point of compliance, the concentration of a hazardous constituent must not exceed—

(a) The Commission approved background concentration of that constituent in the ground water;

(b) The respective value given in the table in paragraph 5C if the constituent is listed in the table and if the background level of the constituent is below the value listed; or

(c) An alternate concentration limit established by the Commission.

5B(6)—Conceptually, background concentrations pose no incremental hazards and the drinking water limits in paragraph 5C state acceptable hazards but these two options may not be practically achievable at a specific site. Alternate concentration limits that present no significant hazard may be proposed by licensees for Commission consideration. Licensees must provide the basis for any proposed limits including consideration of practicable corrective actions, that limits are as low as reasonably achievable, and information on the factors the Commission must consider. The Commission will establish a site specific alternate concentration limit for a hazardous constituent as provided in paragraph 5B(5) of this criterion if it finds that the proposed limit is as low as reasonably achievable, after considering practicable corrective actions, and that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded. In making the present and potential hazard finding, the Commission will consider the following factors:

(a) Potential adverse effects on ground-water quality, considering—

(i) The physical and chemical characteristics of the waste in the licensed site including its potential for migration;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity of ground water and the direction of ground-water flow;

(iv) The proximity and withdrawal rates of ground-water users;

(v) The current and future uses of ground water in the area;

(vi) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground-water quality;

(vii) The potential for health risks caused by human exposure to waste constituents;

(viii) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(ix) The persistence and permanence of the potential adverse effects.

(b) Potential adverse effects on hydraulically-connected surface water quality, considering—

(i) The volume and physical and chemical characteristics of the waste in the licensed site;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity and quality of ground water, and the direction of ground-water flow;

(iv) The patterns of rainfall in the region;

(v) The proximity of the licensed site to surface waters;

(vi) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;

(vii) The existing quality of surface water including other sources of contamination and the cumulative impact on surface water quality;

(viii) The potential for health risks caused by human exposure to waste constituents;

(ix) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents; and

(x) The persistence and permanence of the potential adverse effects.

## 5C—MAXIMUM VALUES FOR GROUND-WATER PROTECTION

Constituent or property	Maximum concentration
Milligrams per liter:	
Arsenic .....	0.05
Barium .....	1.0
Cadmium .....	0.01
Chromium .....	0.05
Lead .....	0.05
Mercury .....	0.002
Selenium .....	0.01
Silver .....	0.05
Endrin (1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,9a-octahydro-1,4-endo, endo-5,8-dimethano naphthalene) .....	0.0002
Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer) .....	0.004

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## 5C—MAXIMUM VALUES FOR GROUND-WATER PROTECTION—Continued

Constituent or property	Maximum concentration
Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenyl)ethane) .....	0.1
Toxaphene (C <sub>10</sub> H <sub>10</sub> C <sub>16</sub> , Technical chlorinated camphene, 67–69 percent chlorine) .....	0.005
2,4-D (2,4-Dichlorophenoxyacetic acid) .....	0.1
2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid) .....	0.01
Picocuries per liter:	
Combined radium-226 and radium-228 .....	5
Gross alpha-particle activity (excluding radon and uranium when producing uranium byproduct material or radon and thorium when producing thorium byproduct material) .....	15

5D—If the ground-water protection standards established under paragraph 5B(1) of this criterion are exceeded at a licensed site, a corrective action program must be put into operation as soon as is practicable, and in no event later than eighteen (18) months after the Commission finds that the standards have been exceeded. The licensee shall submit the proposed corrective action program and supporting rationale for Commission approval prior to putting the program into operation, unless otherwise directed by the Commission. The objective of the program is to return hazardous constituent concentration levels in ground water to the concentration limits set as standards. The licensee's proposed program must address removing the hazardous constituents that have entered the ground water at the point of compliance or treating them in place. The program must also address removing or treating in place any hazardous constituents that exceed concentration limits in ground water between the point of compliance and the downgradient facility property boundary. The licensee shall continue corrective action measures to the extent necessary to achieve and maintain compliance with the ground-water protection standard. The Commission will determine when the licensee may terminate corrective action measures based on data from the ground-water monitoring program and other information that provide reasonable assurance that the ground-water protection standard will not be exceeded.

5E—In developing and conducting ground-water protection programs, applicants and licensees shall also consider the following:

(1) Installation of bottom liners (Where synthetic liners are used, a leakage detection system must be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the ground-water monitoring program conducted as provided in Criterion 7. Where clay liners are proposed or relatively thin, in-situ

clay soils are to be relied upon for seepage control, tests must be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests must be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases deterioration has been observed to occur rather rapidly after about nine months of exposure)).

(2) Mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.

(3) Dewatering of tailings by process devices and/or in-situ drainage systems (At new sites, tailings must be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head of seepage, unless tests show tailings are not amenable to such a system. Where in-situ dewatering is to be conducted, the impoundment bottom must be graded to assure that the drains are at a low point. The drains must be protected by suitable filter materials to assure that drains remain free running. The drainage system must also be adequately sized to assure good drainage).

(4) Neutralization to promote immobilization of hazardous constituents.

5F—Where ground-water impacts are occurring at an existing site due to seepage, action must be taken to alleviate conditions that lead to excessive seepage impacts and restore ground-water quality. The specific seepage control and ground-water protection method, or combination of methods, to be used must be worked out on a site-specific basis. Technical specifications must be prepared to control installation of seepage control systems. A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, must be established to assure the specifications are met.

5G—In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

(1) The chemical and radioactive characteristics of the waste solutions.

(2) The characteristics of the underlying soil and geologic formations particularly as they will control transport of contaminants and solutions. This includes detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations must be determined. This information must be gathered from borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to ground water. The information gathered on boreholes must

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include both geologic and geophysical logs in sufficient number and degree of sophistication to allow determining significant discontinuities, fractures, and channeled deposits of high hydraulic conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. Hydrologic parameters such as permeability may not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) must be conducted to assure actual field properties are adequately understood. Testing must be conducted to allow estimating chemi-sorption attenuation properties of underlying soil and rock.

(3) Location, extent, quality, capacity and current uses of any ground water at and near the site.

5H—Steps must be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

Criterion 6—(1) In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations and shall close the waste disposal area in accordance with a design<sup>1</sup> which provides reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as not to exceed an average<sup>2</sup> release rate of 20 picocuries per square meter per second (pCi/m<sup>2</sup> s) to the extent practicable throughout the effective design life determined pursuant to (1)(i) of this Criterion. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances may not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer may not be taken

<sup>1</sup>In the case of thorium byproduct materials, the standard applies only to design. Monitoring for radon emissions from thorium byproduct materials after installation of an appropriately designed cover is not required.

<sup>2</sup>This average applies to the entire surface of each disposal area over a period of at least one year, but a period short compared to 100 years. Radon will come from both byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from byproduct materials to the atmosphere.

into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that these materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term intervals.

(2) As soon as reasonably achievable after emplacement of the final cover to limit releases of radon-222 from uranium byproduct material and prior to placement of erosion protection barriers or other features necessary for long-term control of the tailings, the licensee shall verify through appropriate testing and analysis that the design and construction of the final radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m<sup>2</sup>s averaged over the entire pile or impoundment using the procedures described in 40 CFR part 61, appendix B, Method 115, or another method of verification approved by the Commission as being at least as effective in demonstrating the effectiveness of the final radon barrier.

(3) When phased emplacement of the final radon barrier is included in the applicable reclamation plan, the verification of radon-222 release rates required in paragraph (2) of this criterion must be conducted for each portion of the pile or impoundment as the final radon barrier for that portion is emplaced.

(4) Within ninety days of the completion of all testing and analysis relevant to the required verification in paragraphs (2) and (3) of this criterion, the uranium mill licensee shall report to the Commission the results detailing the actions taken to verify that levels of release of radon-222 do not exceed 20 pCi/m<sup>2</sup>s when averaged over the entire pile or impoundment. The licensee shall maintain records until termination of the license documenting the source of input parameters including the results of all measurements on which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine compliance. These records shall be kept in a form suitable for transfer to the custodial agency at the time of transfer of the site to DOE or a State for long-term care if requested.

(5) Near surface cover materials (i.e., within the top three meters) may not include waste or rock that contains elevated levels of radium; soils used for near surface cover must be essentially the same, as far as radioactivity is concerned, as that of surrounding surface soils. This is to ensure that surface radon exhalation is not significantly above background because of the cover material itself.

(6) The design requirements in this criterion for longevity and control of radon releases apply to any portion of a licensed and/or disposal site unless such portion contains a concentration of radium in land, averaged

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over areas of 100 square meters, which, as a result of byproduct material, does not exceed the background level by more than: (i) 5 picocuries per gram (pCi/g) of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g of radium-226, or, in the case of thorium byproduct material, radium-228, averaged over 15-cm thick layers more than 15 cm below the surface.

Byproduct material containing concentrations of radionuclides other than radium in soil, and surface activity on remaining structures, must not result in a total effective dose equivalent (TEDE) exceeding the dose from cleanup of radium contaminated soil to the above standard (benchmark dose), and must be at levels which are as low as is reasonably achievable. If more than one residual radionuclide is present in the same 100-square-meter area, the sum of the ratios for each radionuclide of concentration present to the concentration limit will not exceed "1" (unity). A calculation of the potential peak annual TEDE within 1000 years to the average member of the critical group that would result from applying the radium standard (not including radon) on the site must be submitted for approval. The use of decommissioning plans with benchmark doses which exceed 100 mrem/yr, before application of ALARA, requires the approval of the Commission after consideration of the recommendation of the NRC staff. This requirement for dose criteria does not apply to sites that have decommissioning plans for soil and structures approved before June 11, 1999.

(7) The licensee shall also address the non-radiological hazards associated with the wastes in planning and implementing closure. The licensee shall ensure that disposal areas are closed in a manner that minimizes the need for further maintenance. To the extent necessary to prevent threats to human health and the environment, the licensee shall control, minimize, or eliminate post-closure escape of nonradiological hazardous constituents, leachate, contaminated rainwater, or waste decomposition products to the ground or surface waters or to the atmosphere.

**Criterion 6A—**(1) For impoundments containing uranium byproduct materials, the final radon barrier must be completed as *expeditiously as practicable considering technological feasibility* after the pile or impoundment ceases operation in accordance with a written, Commission-approved reclamation plan. (The term as *expeditiously as practicable considering technological feasibility* as specifically defined in the Introduction of this appendix includes factors beyond the control of the licensee.) Deadlines for completion of the final radon barrier and, if applicable, the following interim milestones must be established as a condition of the individual li-

cense: windblown tailings retrieval and placement on the pile and interim stabilization (including dewatering or the removal of freestanding liquids and recontouring). The placement of erosion protection barriers or other features necessary for long-term control of the tailings must also be completed in a timely manner in accordance with a written, Commission-approved reclamation plan.

(2) The Commission may approve a licensee's request to extend the time for performance of milestones related to emplacement of the final radon barrier if, after providing an opportunity for public participation, the Commission finds that the licensee has adequately demonstrated in the manner required in paragraph (2) of Criterion 6 that releases of radon-222 do not exceed an average of 20 pCi/m<sup>2</sup>s. If the delay is approved on the basis that the radon releases do not exceed 20 pCi/m<sup>2</sup>s, a verification of radon levels, as required by paragraph (2) of Criterion 6, must be made annually during the period of delay. In addition, once the Commission has established the date in the reclamation plan for the milestone for completion of the final radon barrier, the Commission may extend that date based on cost if, after providing an opportunity for public participation, the Commission finds that the licensee is making good faith efforts to emplace the final radon barrier, the delay is consistent with the definition of *available technology*, and the radon releases caused by the delay will not result in a significant incremental risk to the public health.

(3) The Commission may authorize by license amendment, upon licensee request, a portion of the impoundment to accept uranium byproduct material or such materials that are similar in physical, chemical, and radiological characteristics to the uranium mill tailings and associated wastes already in the pile or impoundment, from other sources, during the closure process. No such authorization will be made if it results in a delay or impediment to emplacement of the final radon barrier over the remainder of the impoundment in a manner that will achieve levels of radon-222 releases not exceeding 20 pCi/m<sup>2</sup>s averaged over the entire impoundment. The verification required in paragraph (2) of Criterion 6 may be completed with a portion of the impoundment being used for further disposal if the Commission makes a final finding that the impoundment will continue to achieve a level of radon-222 releases not exceeding 20 pCi/m<sup>2</sup>s averaged over the entire impoundment. In this case, after the final radon barrier is complete except for the continuing disposal area, (a) only byproduct material will be authorized for disposal, (b) the disposal will be limited to the specified existing disposal area, and (c) this authorization will only be made after providing opportunity for public participation. Reclamation of the disposal area, as appropriate, must be

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completed in a timely manner after disposal operations cease in accordance with paragraph (1) of Criterion 6; however, these actions are not required to be complete as part of meeting the deadline for final radon barrier construction.

*Criterion 7*—At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program must be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects.

7A—The licensee shall establish a detection monitoring program needed for the Commission to set the site-specific ground-water protection standards in paragraph 5B(1) of this appendix. For all monitoring under this paragraph the licensee or applicant will propose for Commission approval as license conditions which constituents are to be monitored on a site specific basis. A detection monitoring program has two purposes. The initial purpose of the program is to detect leakage of hazardous constituents from the disposal area so that the need to set ground-water protection standards is monitored. If leakage is detected, the second purpose of the program is to generate data and information needed for the Commission to establish the standards under Criterion 5B. The data and information must provide a sufficient basis to identify those hazardous constituents which require concentration limit standards and to enable the Commission to set the limits for those constituents and the compliance period. They may also need to provide the basis for adjustments to the point of compliance. For licenses in effect September 30, 1983, the detection monitoring programs must have been in place by October 1, 1984. For licenses issued after September 30, 1983, the detection monitoring programs must be in place when specified by the Commission in orders or license conditions. Once ground-water protection standards have been established pursuant to paragraph 5B(1), the licensee shall establish and implement a compliance monitoring program. The purpose of the compliance monitoring program is to determine that the hazardous constituent concentrations in ground water continue to comply with the standards set by the Commission. In conjunction with a corrective action program, the licensee shall establish and implement a corrective action monitoring program. The purpose of the corrective action monitoring program is to demonstrate the effectiveness of the corrective actions. Any monitoring program required by this paragraph may be based on ex-

isting monitoring programs to the extent the existing programs can meet the stated objective for the program.

*Criterion 8*—Milling operations must be conducted so that all airborne effluent releases are reduced to levels as low as is reasonably achievable. The primary means of accomplishing this must be by means of emission controls. Institutional controls, such as extending the site boundary and exclusion area, may be employed to ensure that offsite exposure limits are met, but only after all practicable measures have been taken to control emissions at the source. Notwithstanding the existence of individual dose standards, strict control of emissions is necessary to assure that population exposures are reduced to the maximum extent reasonably achievable and to avoid site contamination. The greatest potential sources of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations. During operations and prior to closure, radiation doses from radon emissions from surface impoundments of uranium or thorium byproduct materials must be kept as low as is reasonably achievable.

Checks must be made and logged hourly of all parameters (e.g., differential pressures and scrubber water flow rates) that determine the efficiency of yellowcake stack emission control equipment operation. The licensee shall retain each log as a record for three years after the last entry in the log is made. It must be determined whether or not conditions are within a range prescribed to ensure that the equipment is operating consistently near peak efficiency; corrective action must be taken when performance is outside of prescribed ranges. Effluent control devices must be operative at all times during drying and packaging operations and whenever air is exhausting from the yellowcake stack. Drying and packaging operations must terminate when controls are inoperative. When checks indicate the equipment is not operating within the range prescribed for peak efficiency, actions must be taken to restore parameters to the prescribed range. When this cannot be done without shutdown and repairs, drying and packaging operations must cease as soon as practicable. Operations may not be restarted after cessation due to off-normal performance until needed corrective actions have been identified and implemented. All these cessations, corrective actions, and restarts must be reported to the appropriate NRC regional office as indicated in Criterion 8A, in writing, within ten days of the subsequent restart.

To control dusting from tailings, that portion not covered by standing liquids must be wetted or chemically stabilized to prevent or

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minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration must be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments because this will help in controlling particulate and radon emissions during operation. To control dusting from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.

Milling operations producing or involving thorium byproduct material must be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment.

Uranium and thorium byproduct materials must be managed so as to conform to the applicable provisions of title 40 of the Code of Federal Regulations, part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, subpart C, Uranium, Radium, and Vanadium Ores Subcategory," as codified on January 1, 1983.

*Criterion 8A*—Daily inspections of tailings or waste retention systems must be conducted by a qualified engineer or scientist and documented. The licensee shall retain the documentation for each daily inspection as a record for three years after the documentation is made. The appropriate NRC regional office as indicated in appendix D to 10 CFR part 20 of this chapter, or the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC, 20555, must be immediately notified of any failure in a tailings or waste retention system that results in a release of tailings or waste into unrestricted areas, or of any unusual conditions (conditions not contemplated in the design of the retention system) that is not corrected could indicate the potential or lead to failure of the system and result in a release of tailings or waste into unrestricted areas.

## II. FINANCIAL CRITERIA

*Criterion 9*—Financial surety arrangements must be established by each mill operator prior to the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for

the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements must be based on Commission-approved cost estimates in a Commission-approved plan for (1) decontamination and decommissioning of mill buildings and the milling site to levels which allow unrestricted use of these areas upon decommissioning, and (2) the reclamation of tailings and/or waste areas in accordance with technical criteria delineated in Section I of this appendix. The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. The surety must also cover the payment of the charge for long-term surveillance and control required by Criterion 10. In establishing specific surety arrangements, the licensee's cost estimates must take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning and reclamation work. In order to avoid unnecessary duplication and expense, the Commission may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for such decommissioning, decontamination, reclamation, and long-term site surveillance and control, provided such arrangements are considered adequate to satisfy these requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long-term funding charge is clearly identified and committed for use in accomplishing these activities. The licensee's surety mechanism will be reviewed annually by the Commission to assure, that sufficient funds would be available for completion of the reclamation plan if the work had to be performed by an independent contractor. The amount of surety liability should be adjusted to recognize any increases or decreases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability must be retained until final compliance with the reclamation plan is determined.

This will yield a surety that is at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal. The term of the surety mechanism must be open ended, unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance would be provided with

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a surety instrument which is written for a specified period of time (e.g., 5 years) yet which must be automatically renewed unless the surety notifies the beneficiary (the Commission or the State regulatory agency) and the principal (the licensee) some reasonable time (e.g., 90 days) prior to the renewal date of their intention not to renew. In such a situation the surety requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief period of time to allow at least 60 days for the regulatory agency to collect.

Proof of forfeiture must not be necessary to collect the surety so that in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Financial surety arrangements generally acceptable to the Commission are:

- (a) Surety bonds;
- (b) Cash deposits;
- (c) Certificates of deposits;
- (d) Deposits of government securities;
- (e) Irrevocable letters or lines of credit; and
- (f) Combinations of the above or such other types of arrangements as may be approved by the Commission. However, self insurance, or any arrangement which essentially constitutes self insurance (e.g., a contract with a State or Federal agency), will not satisfy the surety requirement since this provides no additional assurance other than that which already exists through license requirements.

*Criterion 10*—A minimum charge of \$250,000 (1978 dollars) to cover the costs of long-term surveillance must be paid by each mill operator to the general treasury of the United States or to an appropriate State agency prior to the termination of a uranium or thorium mill license.

If site surveillance or control requirements at a particular site are determined, on the basis of a site-specific evaluation, to be significantly greater than those specified in *Criterion 12* (e.g., if fencing is determined to be necessary), variance in funding requirements may be specified by the Commission. In any case, the total charge to cover the costs of long-term surveillance must be such that, with an assumed 1 percent annual real interest rate, the collected funds will yield interest in an amount sufficient to cover the annual costs of site surveillance. The total charge will be adjusted annually prior to actual payment to recognize inflation. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

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## III. SITE AND BYPRODUCT MATERIAL OWNERSHIP

*Criterion 11*—A. These criteria relating to ownership of tailings and their disposal sites become effective on November 8, 1981, and apply to all licenses terminated, issued, or renewed after that date.

B. Any uranium or thorium milling license or tailings license must contain such terms and conditions as the Commission determines necessary to assure that prior to termination of the license, the licensee will comply with ownership requirements of this criterion for sites used for tailings disposal.

C. Title to the byproduct material licensed under this part and land, including any interests therein (other than land owned by the United States or by a State) which is used for the disposal of any such byproduct material, or is essential to ensure the long term stability of such disposal site, must be transferred to the United States or the State in which such land is located, at the option of such State. In view of the fact that physical isolation must be the primary means of long-term control, and Government land ownership is a desirable supplementary measure, ownership of certain severable subsurface interests (for example, mineral rights) may be determined to be unnecessary to protect the public health and safety and the environment. In any case, however, the applicant/operator must demonstrate a serious effort to obtain such subsurface rights, and must, in the event that certain rights cannot be obtained, provide notification in local public land records of the fact that the land is being used for the disposal of radioactive material and is subject to either an NRC general or specific license prohibiting the disruption and disturbance of the tailings. In some rare cases, such as may occur with deep burial where no ongoing site surveillance will be required, surface land ownership transfer requirements may be waived. For licenses issued before November 8, 1981, the Commission may take into account the status of the ownership of such land, and interests therein, and the ability of a licensee to transfer title and custody thereof to the United States or a State.

D. If the Commission subsequent to title transfer determines that use of the surface or subsurface estates, or both, of the land transferred to the United States or to a State will not endanger the public health, safety, welfare, or environment, the Commission may permit the use of the surface or subsurface estates, or both, of such land in a manner consistent with the provisions provided in these criteria. If the Commission permits such use of such land, it will provide the person who transferred such land with the right of first refusal with respect to such use of such land.

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E. Material and land transferred to the United States or a State in accordance with this Criterion must be transferred without cost to the United States or a State other than administrative and legal costs incurred in carrying out such transfer.

F. The provisions of this part respecting transfer of title and custody to land and tailings and wastes do not apply in the case of lands held in trust by the United States for any Indian tribe or lands owned by such Indian tribe subject to a restriction against alienation imposed by the United States. In the case of such lands which are used for the disposal of byproduct material, as defined in this part, the licensee shall enter into arrangements with the Commission as may be appropriate to assure the long-term surveillance of such lands by the United States.

## IV. LONG-TERM SITE SURVEILLANCE

*Criterion 12*—The final disposition of tailings, residual radioactive material, or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections must be conducted by the government agency responsible for long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring. Results of the inspections for all the sites under the licensee's jurisdiction will be reported to the Commission annually within 90 days of the last site inspection in that calendar year. Any site where unusual damage or disruption is discovered during the inspection, however, will require a preliminary site inspection report to be submitted within 60 days. On the basis of a site specific evaluation, the Commission may require more frequent site inspections if necessary due to the features of a particular disposal site. In this case, a preliminary inspection report is required to be submitted within 60 days following each inspection.

## V. HAZARDOUS CONSTITUENTS

*Criterion 13*—Secondary ground-water protection standards required by Criterion 5 of this appendix are concentration limits for individual hazardous constituents. The following list of constituents identifies the constituents for which standards must be set and complied with if the specific constituent is reasonably expected to be in or derived from the byproduct material and has been detected in ground water. For purposes of this appendix, the property of gross alpha activity will be treated as if it is a hazardous constituent. Thus, when setting standards under paragraph 5B(5) of Criterion 5, the Commission will also set a limit for gross alpha activity. The Commission does not consider the following list imposed by 40 CFR part 192 to be exhaustive and may de-

termine other constituents to be hazardous on a case-by-case basis, independent of those specified by the U.S. Environmental Protection Agency in part 192.

## Hazardous Constituents

Acetonitrile (Ethanenitrile)  
 Acetophenone (Ethanone, 1-phenyl)  
 3-(alpha-Acetonilylbenzyl)-4-hydroxycoumarin and salts (Warfarin)  
 2-Acetylaminofluorene (Acetamide, N-(9H-fluoren-2-yl)-)  
 Acetyl chloride (Ethanoyl chloride)  
 1-Acetyl-2-thiourea (Acetamide, N-(aminothioxomethyl)-)  
 Acrolein (2-Propenal)  
 Acrylamide (2-Propenamide)  
 Acrylonitrile (2-Propenenitrile)  
 Aflatoxins  
 Aldrin (1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a,8b-hexahydro-endo, exo-1,4:5,8-Dimethanonaphthalene)  
 Allyl alcohol (2-Propen-1-ol)  
 Aluminum phosphide  
 4-Aminobiphenyl ([1,1'-Biphenyl]-4-amine)  
 6-Amino-1,1a,2,8,8a,8b-hexahydro-8-(hydroxymethyl)-8a-methoxy-5-methyl-carbamate azirino[2,3':3,4]pyrrolo[1,2-a]indole-4,7-dione, (ester) (Mitomycin C)  
 (Azirino[2,3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[(aminocarbonyl)oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-)  
 5-(Aminomethyl)-3-isoxazolol (3(2H)-isoxazolone, 5-(aminomethyl)-) 4-  
 Aminopyridine (4-Pyridinamine)  
 Amitrole (1H-1,2,4-Triazol-3-amine)  
 Aniline (Benzenamine)  
 Antimony and compounds, N.O.S.<sup>3</sup>  
 Aramite (Sulfurous acid, 2-chloroethyl-, 2-[4-(1,1-dimethylethyl)-phenoxy]-1-methylethyl ester)  
 Arsenic and compounds, N.O.S.<sup>3</sup>  
 Arsenic acid (Orthoarsenic acid)  
 Arsenic pentoxide (Arsenic (V) oxide)  
 Arsenic trioxide (Arsenic (III) oxide)  
 Auramine (Benzenamine, 4,4'-carbonimidoylbis[N,N-Dimethyl-, monohydrochloride])  
 Azaserine (L-Serine, diazoacetate (ester))  
 Barium and compounds, N.O.S.<sup>3</sup>  
 Barium cyanide  
 Benz[c]acridine (3,4-Benzacridine)  
 Benz[a]anthracene (1,2-Benzanthracene)  
 Benzene (Cyclohexatriene)  
 Benzenearsonic acid (Arsonic acid, phenyl-)  
 Benzene, dichloromethyl- (Benzal chloride)  
 Benzenethiol (Thiophenol)  
 Benzo[d]fluoranthene (2,3-benzofluoranthene)  
 Benzo[e]fluoranthene (2,3-benzofluoranthene)

<sup>3</sup>The abbreviation N.O.S. (not otherwise specified) signifies those members of the general class not specifically listed by name in this list.

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Benzo[j]fluoranthene (7,8-Benzofluoranthene)  
 Benzo[a]pyrene (3,4-Benzopyrene)  
 p-Benzoquinone (1,4-Cyclohexadienedione)  
 Benzotrichloride (Benzene, trichloromethyl)  
 Benzyl chloride (Benzene, (chloromethyl)-)  
 Beryllium and compounds, N.O.S.<sup>3</sup>  
 Bis(2-chloroethoxy)methane (Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-])  
 Bis(2-chloroethyl) ether (Ethane, 1,1'-oxybis[2-chloro-])  
 N,N-Bis(2-chloroethyl)-2-naphthylamine (Chlornaphazine)  
 Bis(2-chloroisopropyl) ether (Propane, 2,2'-oxybis[2-chloro-])  
 Bis(chloromethyl) ether (Methane, oxybis[chloro-])  
 Bis(2-ethylhexyl) phthalate (1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester)  
 Bromoacetone (2-Propanone, 1-bromo-)  
 Bromomethane (Methyl bromide)  
 4-Bromophenyl phenyl ether (Benzene, 1-bromo-4-phenoxy-)  
 Brucine (Strychnidin-10-one, 2,3-dimethoxy-)  
 2-Butanone peroxide (Methyl ethyl ketone, peroxide)  
 Butyl benzyl phthalate (1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester)  
 2-sec-Butyl-4,6-dinitrophenol (DNBP) (Phenol, 2,4-dinitro-6-(1-methylpropyl)-)  
 Cadmium and compounds, N.O.S.<sup>3</sup>  
 Calcium chromate (Chromic acid, calcium salt)  
 Calcium cyanide  
 Carbon disulfide (Carbon bisulfide)  
 Carbon oxyfluoride (Carbonyl fluoride)  
 Chloral (Acetaldehyde, trichloro-)  
 Chlorambucil (Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-)  
 Chlordane (alpha and gamma isomers) (4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3,4,7,7a-tetrahydro-) (alpha and gamma isomers)  
 Chlorinated benzenes, N.O.S.<sup>3</sup>  
 Chlorinated ethane, N.O.S.<sup>3</sup>  
 Chlorinated fluorocarbons, N.O.S.<sup>3</sup>  
 Chlorinated naphthalene, N.O.S.<sup>3</sup>  
 Chlorinated phenol, N.O.S.<sup>3</sup>  
 Chloroacetaldehyde (Acetaldehyde, chloro-)  
 Chloroalkyl ethers, N.O.S.<sup>3</sup>  
 p-Chloroaniline (Benzenamine, 4-chloro-)  
 Chlorobenzene (Benzene, chloro-)  
 Chlorobenzilate (Benzenecetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-ethyl ester)  
 p-Chloro-m-cresol (Phenol, 4-chloro-3-methyl)  
 1-Chloro-2,3-epoxypropane (Oxirane, 2-(chloromethyl)-)  
 2-Chloroethyl vinyl ether (Ethene, 2-(chloroethoxy)-)  
 Chloroform (Methane, trichloro-)  
 Chloromethane (Methyl chloride)  
 Chloromethyl methyl ether (Methane, chloromethoxy-)  
 2-Chloronaphthalene (Naphthalene, betachloro-)  
 2-Chlorophenol (Phenol, o-chloro-)  
 1-(o-Chlorophenyl)thiourea (Thiourea, (2-chlorophenyl)-)  
 3-Chloropropionitrile (Propanenitrile, 3-chloro-)  
 Chromium and compounds, N.O.S.<sup>3</sup>  
 Chrysene (1,2-Benzphenanthrene)  
 Citrus red No. 2 (2-Naphthol, 1-[(2,5-dimethoxyphenyl)azo]-)  
 Coal tars  
 Copper cyanide  
 Creosote (Creosote, wood)  
 Cresols (Cresylic acid) (Phenol, methyl-)  
 Crotonaldehyde (2-Butenal)  
 Cyanides (soluble salts and complexes), N.O.S.<sup>3</sup>  
 Cyanogen (Ethanedinitrile)  
 Cyanogen bromide (Bromine cyanide)  
 Cyanogen chloride (Chlorine cyanide)  
 Cycasin (beta-D-Glucopyranoside, (methyl-ONN-azoxy)methyl-)  
 2-Cyclohexyl-4,6-dinitrophenol (Phenol, 2-cyclohexyl-4,6-dinitro-)  
 Cyclophosphamide (2H-1,3,2,-Oxazaphosphorine, [bis(2-chloroethyl)amino]-tetrahydro-,2-oxide)  
 Daunomycin (5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl]oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-)  
 DDD (Dichlorodiphenyldichloroethane) (Ethane, 1,1-dichloro-2,2-bis(p-chlorophenyl)-)  
 DDE (Ethylene, 1,1-dichloro-2,2-bis(4-chlorophenyl)-)  
 DDT (Dichlorodiphenyltrichloroethane) (Ethane, 1,1,1-trichloro-2,2-bis(p-chlorophenyl)-)  
 Diallylate (S-(2,3-dichloroallyl) diisopropylthiocarbamate)  
 Dibenz[a,h]acridine (1,2,5,6-Dibenzacridine)  
 Dibenz[a,j]acridine (1,2,7,8-Dibenzacridine)  
 Dibenz[a,h]anthracene (1,2,5,6-Dibenzanthracene)  
 7H-Dibenzo[c,g]carbazole (3,4,5,6-Dibenzcarbazole)  
 Dibenzo[a,e]pyrene (1,2,4,5-Dibenzpyrene)  
 Dibenzo[a,h]pyrene (1,2,5,6-Dibenzpyrene)  
 Dibenzo[a,i]pyrene (1,2,7,8-Dibenzpyrene)  
 1,2-Dibromo-3-chloropropane (Propane, 1,2-dibromo-3-chloro-)  
 1,2-Dibromoethane (Ethylene dibromide)  
 Dibromomethane (Methylene bromide)  
 Di-n-butyl phthalate (1,2-Benzenedicarboxylic acid, dibutyl ester)  
 o-Dichlorobenzene (Benzene, 1,2-dichloro-)  
 m-Dichlorobenzene (Benzene, 1,3-dichloro-)  
 p-Dichlorobenzene (Benzene, 1,4-dichloro-)  
 Dichlorobenzene, N.O.S.<sup>3</sup> (Benzene, dichloro-, N.O.S.<sup>3</sup>)  
 3,3'-Dichlorobenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-)  
 1,4-Dichloro-2-butene (2-Butene, 1,4-dichloro-)  
 Dichlorodifluoromethane (Methane, dichlorodifluoro-)

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- 1,1-Dichloroethane (Ethylidene dichloride)  
 1,2-Dichloroethane (Ethylene dichloride)  
 trans-1,2-Dichloroethene (1,2-Dichloroethylene)  
 Dichloroethylene, N.O.S.<sup>3</sup> (Ethene, dichloro-, N.O.S.<sup>3</sup>)  
 1,1-Dichloroethylene (Ethene, 1,1-dichloro-)  
 Dichloromethane (Methylene chloride)  
 2,4-Dichlorophenol (Phenol, 2,4-dichloro-)  
 2,6-Dichlorophenol (Phenol, 2,6-dichloro-)  
 2,4-Dichlorophenoxyacetic acid (2,4-D), salts and esters (Acetic acid, 2,4-dichlorophenoxy-, salts and esters)  
 Dichlorophenylarsine (Phenyl dichloroarsine)  
 Dichloropropane, N.O.S.<sup>3</sup> (Propane, dichloro-, N.O.S.<sup>3</sup>)  
 1,2-Dichloropropane (Propylene dichloride)  
 Dichloropropanol, N.O.S.<sup>3</sup> (Propanol, dichloro-, N.O.S.<sup>3</sup>)  
 Dichloropropene, N.O.S.<sup>3</sup> (Propene, dichloro-, N.O.S.<sup>3</sup>)  
 1,3-Dichloropropene (1-Propene, 1,3-dichloro-)  
 Dieldrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octa-hydro-endo, exo-1,4,5,8-Dimethanonaphthalene)  
 1,2,3,4-Diepoxybutane (2,2'-Bioxirane)  
 Diethylarsine (Arsine, diethyl-)  
 N,N-Diethylhydrazine (Hydrazine, 1,2-diethyl)  
 O,O-Diethyl S-methyl ester of phosphorodithioic acid (Phosphorodithioic acid, O,O-diethyl S-methyl ester)  
 O,O-Diethylphosphoric acid, O-p-nitrophenyl ester (Phosphoric acid, diethyl p-nitrophenyl ester)  
 Diethyl phthalate (1,2-Benzenedicarboxylic acid, diethyl ester)  
 O,O-Diethyl O-2-pyrazinyl phosphorothioate (Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester)  
 Diethylstilbesterol (4,4'-Stilbenediol, alpha, alpha-diethyl, bis(dihydrogen phosphate, (E)-)  
 Dihydrosafrole (Benzene, 1,2-methylenedioxy-4-propyl-)  
 3,4-Dihydroxy-alpha-(methylamino)methyl benzyl alcohol (1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-)  
 Dilsopropylfluorophosphate (DFP) (Phosphorofluoric acid, bis(1-methylethyl) ester)  
 Dimethoate (Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester)  
 3,3'-Dimethoxybenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-)  
 p-Dimethylaminoazobenzene (Benzenamine, N,N-dimethyl-4-(phenylazo)-)  
 7,12-Dimethylbenz[a]anthracene (1,2-Benzanthracene, 7,12-dimethyl-)  
 3,3'-Dimethylbenzidine ([1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-)  
 Dimethylcarbamoyl chloride (Carbamoyl chloride, dimethyl-)  
 1,1-Dimethylhydrazine (Hydrazine, 1,1-dimethyl-)  
 1,2-Dimethylhydrazine (Hydrazine, 1,2-dimethyl-)  
 3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino) carbonyl] oxime (Thiofanox)  
 alpha, alpha-Dimethylphenethylamine (Ethanamine, 1,1-dimethyl-2-phenyl-)  
 2,4-Dimethylphenol (Phenol, 2,4-dimethyl-)  
 Dimethyl phthalate (1,2-Benzenedicarboxylic acid, dimethyl ester)  
 Dimethyl sulfate (Sulfuric acid, dimethyl ester)  
 Dinitrobenzene, N.O.S.<sup>3</sup> (Benzene, dinitro-, N.O.S.<sup>3</sup>)  
 4,6-Dinitro-o-cresol and salts (Phenol, 2,4-dinitro-6-methyl-, and salts)  
 2,4-Dinitrophenol (Phenol, 2,4-dinitro-)  
 2,4-Dinitrotoluene (Benzene, 1-methyl-2,4-dinitro-)  
 2,6-Dinitrotoluene (Benzene, 1-methyl-2,6-dinitro-)  
 Di-n-octyl phthalate (1,2-Benzenedicarboxylic acid, dioctyl ester)  
 1,4-Dioxane (1,4-Diethylene oxide)  
 Diphenylamine (Benzenamine, N-phenyl-)  
 1,2-Diphenylhydrazine (Hydrazine, 1,2-diphenyl-)  
 Di-n-propylnitrosamine (N-Nitroso-di-n-propylamine)  
 Disulfoton (O,O-diethyl S-[2-(ethylthio)ethyl] phosphorodithioate)  
 2,4-Dithiobiuret (Thioimidodicarbonic diamide)  
 Endosulfan (5-Norbornene, 2,3-dimethanol, 1,4,5,6,7,7-hexachloro-, cyclic sulfite)  
 Endrin and metabolites (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo, endo-1,4,5,8-dimethanonaphthalene, and metabolites)  
 Ethyl carbamate (Urethan) (Carbamic acid, ethyl ester)  
 Ethyl cyanide (propanenitrile)  
 Ethylenebisdithiocarbamic acid, salts and esters (1,2-Ethanedithiol-biscarbamodithioic acid, salts and esters)  
 Ethyleneimine (Aziridine)  
 Ethylene oxide (Oxirane)  
 Ethylenethiourea (2-Imidazolidinethione)  
 Ethyl methacrylate (2-Propenoic acid, 2-methyl-, ethyl ester)  
 Ethyl methanesulfonate (Methanesulfonic acid, ethyl ester)  
 Fluoranthene (Benzo[j,k]fluorene)  
 Fluorine  
 2-Fluoroacetamide (Acetamide, 2-fluoro-)  
 Fluoroacetic acid, sodium salt (Acetic acid, fluoro-, sodium salt)  
 Formaldehyde (Methylene oxide)  
 Formic acid (Methanoic acid)  
 Glycidylaldehyde (1-Propanol-2,3-epoxy)  
 Halomethane, N.O.S.<sup>3</sup>  
 Heptachlor (4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-)  
 Heptachlor epoxide (alpha, beta, and gamma isomers) (4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7-

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tetrahydro-, alpha, beta, and gamma isomers)  
 Hexachlorobenzene (Benzene, hexachloro-)  
 Hexachlorobutadiene (1,3-Butadiene, 1,1,2,3,4,4-hexachloro-)  
 Hexachlorocyclohexane (all isomers) (Lindane and isomers)  
 Hexachlorocyclopentadiene (1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-)  
 Hexachloroethane (Ethane, 1,1,1,2,2,2-hexachloro-)  
 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,endo-dimethanonaphthalene (Hexachlorohexahydro-endo,endo-dimethanonaphthalene)  
 Hexachlorophene (2,2'-Methylenebis(3,4,6-trichlorophenol))  
 Hexachloropropene (1-Propene, 1,1,2,3,3,3-hexachloro-)  
 Hexaethyl tetraphosphate (Tetraphosphoric acid, hexaethyl ester)  
 Hydrazine (Diamine)  
 Hydrocyanic acid (Hydrogen cyanide)  
 Hydrofluoric acid (Hydrogen fluoride)  
 Hydrogen sulfide (Sulfur hydride)  
 Hydroxydimethylarsine oxide (Cacodylic acid)  
 Indeno (1,2,3-cd)pyrene (1,10-(1,2-phenylene)pyrene)  
 Iodomethane (Methyl iodide)  
 Iron dextran (Ferric dextran)  
 Isocyanic acid, methyl ester (Methyl isocyanate)  
 Isobutyl alcohol (1-Propanol, 2-methyl-)  
 Isosafrole (Benzene, 1,2-methylenedioxy-4-allyl-)  
 Kepone (Decachlorooctahydro-1,3,4-Methano-2H-cyclobuta[cd]pentalen-2-one)  
 Lasiocarpine (2-Butenoic acid, 2-methyl-, 7-[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy)methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester)  
 Lead and compounds, N.O.S.<sup>3</sup>  
 Lead acetate (Acetic acid, lead salt)  
 Lead phosphate (Phosphoric acid, lead salt)  
 Lead subacetate (Lead, bis(acetato-0)tetrahydroxytri-)  
 Maleic anhydride (2,5-Furandione)  
 Maleic hydrazide (1,2-Dihydro-3,6-pyridazinedione)  
 Malononitrile (Propanedinitrile)  
 Melfalan (Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-,L-)  
 Mercury fulminate (Fulminic acid, mercury salt)  
 Mercury and compounds, N.O.S.<sup>3</sup>  
 Methacrylonitrile (2-Propenenitrile, 2-methyl-)  
 Methanethiol (Thiomethanol)  
 Methapyrilene (Pyridine, 2-[(2-dimethylamino)ethyl]-2-thenylamino-)  
 Metholmyl (Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester)  
 Methoxychlor (Ethane, 1,1,1-trichloro-2,2'-bis(p-methoxyphenyl)-)  
 2-Methylaziridine (1,2-Propylenimine)  
 3-Methylcholanthrene (Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-)  
 Methyl chlorocarbonate (Carbonochloridic acid, methyl ester)  
 4,4'-Methylenebis(2-chloroaniline) (Benzenamine, 4,4'-methylenebis- (2-chloro-))  
 Methyl ethyl ketone (MEK) (2-Butanone)  
 Methyl hydrazine (Hydrazine, methyl-)  
 2-Methylactonitrile (Propanenitrile, 2-hydroxy-2-methyl-)  
 Methyl methacrylate (2-Propenoic acid, 2-methyl-, methyl ester)  
 Methyl methanesulfonate (Methanesulfonic acid, methyl ester)  
 2-Methyl-2-(methylthio)propionaldehyde-o-(methylcarbonyl) oxime (Propanal, 2-methyl-2-(methylthio)-, 0-[(methylamino)carbonyl]oxime)  
 N-Methyl-N'-nitro-N-nitrosoguanidine (Guanidine, N-nitroso-N-methyl-N'- nitro-)  
 Methyl parathion (0,0-dimethyl 0-(4-nitrophenyl) phosphorothioate)  
 Methylthiouracil (4-IH-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-)  
 Molybdenum and compounds, N.O.S.<sup>3</sup>  
 Mustard gas (Sulfide, bis(2-chloroethyl)-)  
 Naphthalene  
 1,4-Naphthoquinone (1,4-Naphthalenedione)  
 1-Naphthylamine (alpha-Naphthylamine)  
 2-Naphthylamine (beta-Naphthylamine)  
 1-Naphthyl-2-thiourea (Thiourea, 1-naphthalenyl-)  
 Nickel and compounds, N.O.S.<sup>3</sup>  
 Nickel carbonyl (Nickel tetracarbonyl)  
 Nickel cyanide (Nickel (II) cyanide)  
 Nicotine and salts (Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts)  
 Nitric oxide (Nitrogen (II) oxide)  
 p-Nitroaniline (Benzenamine, 4-nitro-)  
 Nitrobenzine (Benzene, nitro-)  
 Nitrogen dioxide (Nitrogen (IV) oxide)  
 Nitrogen mustard and hydrochloride salt (Ethanamine, 2-chloro-, N-(2-chloroethyl)-N-methyl-, and hydrochloride salt)  
 Nitrogen mustard N-Oxide and hydrochloride salt (Ethanamine, 2-chloro-, N-(2-chloroethyl)-N-methyl-, and hydrochloride salt)  
 Nitroglycerine (1,2,3-Propanetriol, trinitrate)  
 4-Nitrophenol (Phenol, 4-nitro-)  
 4-Nitroquinoline-1-oxide (Quinoline, 4-nitro-1-oxide-)  
 Nitrosamine, N.O.S.<sup>3</sup>  
 N-Nitrosodi-n-butylamine (1-Butanamine, N-butyl-N-nitroso-)  
 N-Nitrosodiethanolamine (Ethanol, 2,2'-(nitrosoimino)bis-)  
 N-Nitrosodiethylamine (Ethanamine, N-ethyl-N-nitroso-)  
 N-Nitrosodimethylamine (Dimethylnitrosamine)  
 N-Nitroso-N-ethylurea (Carbamide, N-ethyl-N-nitroso-)  
 N-Nitrosomethylethylamine (Ethanamine, N-methyl-N-nitroso-)

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N-Nitroso-N-methylurea (Carbamide, N-methyl-N-nitroso-)  
 N-Nitroso-N-methylurethane (Carbamic acid, methylnitroso-, ethyl ester)  
 N-Nitrosomethylvinylamine (Ethenamine, N-methyl-N-nitroso-)  
 N-Nitrosomorpholine (Morpholine, N-nitroso-)  
 N-Nitrosornicotine (Nicotinic acid, N-nitroso-)  
 N-Nitrosopiperidine (Piperidine, hexahydro-, N-nitroso-)  
 Nitrosopyrrolidine (Pyrrole, tetrahydro-, N-nitroso-)  
 N-Nitrososarcosine (Sarcosine, N-nitroso-)  
 5-Nitro-o-toluidine (Benzenamine, 2-methyl-5-nitro-)  
 Octamethylpyrophosphoramide (Diphosphoramide, octamethyl-)  
 Osmium tetroxide (Osmium (VIII) oxide)  
 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid (Endothal)  
 Paraldehyde (1,3,5-Trioxane, 2,4,6-trimethyl-)  
 Parathion (Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl)ester)  
 Pentachlorobenzene (Benzene, pentachloro-)  
 Pentachloroethane (Ethane, pentachloro-)  
 Pentachloronitrobenzene (PCNB) (Benzene, pentachloronitro-)  
 Pentachlorophenol (Phenol, pentachloro-)  
 Phenacetin (Acetamide, N-(4-ethoxyphenyl)-)  
 Phenol (Benzene, hydroxy-)  
 Phenylenediamine (Benzenediamine)  
 Phenylmercury acetate (Mercury, acetatophenyl-)  
 N-Phenylthiourea (Thiourea, phenyl-)  
 Phosgene (Carbonyl chloride)  
 Phosphine (Hydrogen phosphide)  
 Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester (Phorate)  
 Phosphorothioic acid, O,O-dimethyl O-[p-((dimethylamino)sulfonyl)phenyl] ester (Famphur)  
 Phthalic acid esters, N.O.S.<sup>3</sup> (Benzene, 1,2-dicarboxylic acid, esters, N.O.S.<sup>3</sup>)  
 Phthalic anhydride (1,2-Benzenedicarboxylic acid anhydride)  
 2-Picoline (Pyridine, 2-methyl-)  
 Polychlorinated biphenyl, N.O.S.<sup>3</sup>  
 Potassium cyanide  
 Potassium silver cyanide (Argentate(1-), dicyano-, potassium)  
 Pronamide (3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide)  
 1,3-Propane sultone (1,2-Oxathiolane, 2,2-dioxide)  
 n-Propylamine (1-Propanamine)  
 Propylthiouracil (Undecamethylenediamine, N,N'-bis(2-chlorobenzyl-), dihydrochloride)  
 2-Propyn-1-ol (Propargyl alcohol)  
 Pyridine  
 Radium-226 and -228  
 Reserpine (Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[3,4,5-trimethoxybenzoyl]oxy-, methyl ester)  
 Resorcinol (1,3-Benzenediol)  
 Saccharin and salts (1,2-Benzisothiazolin-3-one, 1,1-dioxide, and salts)  
 Safrole (Benzene, 1,2-methylenedioxy-4-allyl-)  
 Selenious acid (Selenium dioxide)  
 Selenium and compounds, N.O.S.<sup>3</sup>  
 Selenium sulfide (Sulfur selenide)  
 Selenourea (Carbamimidoseleonic acid)  
 Silver and compounds, N.O.S.<sup>3</sup>  
 Silver cyanide  
 Sodium cyanide  
 Streptozotocin (D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-)  
 Strontium sulfide  
 Strychnine and salts (Strychnidin-10-one, and salts)  
 1,2,4,5-Tetrachlorobenzene (Benzene, 1,2,4,5-tetrachloro-)  
 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (Dibenzo-p-dioxin, 2,3,7,8-tetrachloro-)  
 Tetrachloroethane, N.O.S.<sup>3</sup> (Ethane, tetrachloro-, N.O.S.<sup>3</sup>)  
 1,1,1,2-Tetrachlorethane (Ethane, 1,1,1,2-tetrachloro-)  
 1,1,2,2-Tetrachlorethane (Ethane, 1,1,2,2-tetrachloro-)  
 Tetrachloroethane (Ethene, 1,1,2,2-tetrachloro-)  
 Tetrachloromethane (Carbon tetrachloride)  
 2,3,4,6-Tetrachlorophenol (Phenol, 2,3,4,6-tetrachloro-)  
 Tetraethyldithiopyrophosphate (Dithiopyrophosphoric acid, tetraethyl-ester)  
 Tetraethyl lead (Plumbane, tetraethyl-)  
 Tetraethylpyrophosphate (Pyrophosphoric acid, tetraethyl ester)  
 Tetranitromethane (Methane, tetranitro-)  
 Thallium and compounds, N.O.S.<sup>3</sup>  
 Thallous oxide (Thallium (I) oxide)  
 Thallium (I) acetate (Acetic acid, thallium (I) salt)  
 Thallium (I) carbonate (Carbonic acid, dithallium (I) salt)  
 Thallium (I) chloride  
 Thallium (I) nitrate (Nitric acid, thallium (I) salt)  
 Thallium selenite  
 Thallium (I) sulfate (Sulfuric acid, thallium (I) salt)  
 Thioacetamide (Ethanethioamide)  
 Thiosemicarbazide (Hydrazinecarbothioamide)  
 Thiourea (Carbamide thio-)  
 Thiuram (Bis(dimethylthiocarbonyl) disulfide)  
 Thorium and compounds, N.O.S.<sup>3</sup> when producing thorium byproduct material  
 Toluene (Benzene, methyl-)  
 Toluenediamine (Diaminotoluene)  
 o-Toluidine hydrochloride (Benzenamine, 2-methyl-, hydrochloride)  
 Toluene diisocyanate (Benzene, 1,3-diisocyanatomethyl-)  
 Toxaphene (Camphene, octachloro-)  
 Tribromomethane (Bromoform)

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and Environmental Management Programs, with a copy to the Regional Administrator of the appropriate U.S. Nuclear Regulatory Commission Regional Office listed in appendix D of part 20 of this chapter, the name and address of the person receiving the source material pursuant to such transfer.

(e) Any person receiving, acquiring, possessing, using, or transferring depleted uranium pursuant to the general license established by paragraph (a) of this section is exempt from the requirements of parts 19, 20 and 21 of this chapter with respect to the depleted uranium covered by that general license.

[41 FR 53331, Dec. 6, 1976, as amended at 42 FR 28896, June 6, 1977; 43 FR 6923, Feb. 17, 1978; 43 FR 52202, Nov. 9, 1978; 52 FR 31611, Aug. 21, 1987; 60 FR 24551, May 9, 1995; 68 FR 58807, Oct. 10, 2003; 73 FR 5720, Jan. 31, 2008]

**§ 40.26 General license for possession and storage of byproduct material as defined in this part.**

(a) A general license is hereby issued to receive title to, own, or possess byproduct material as defined in this part without regard to form or quantity.

(b) The general license in paragraph (a) of this section applies only: In the case of licensees of the Commission, where activities that result in the production of byproduct material are authorized under a specific license issued by the Commission pursuant to this part, to byproduct material possessed or stored at an authorized disposal containment area or transported incident to such authorized activity: *Provided*, That authority to receive title to, own, or possess byproduct material under this general license shall terminate when the specific license for source material expires, is renewed, or is amended to include a specific license for byproduct material as defined in this part.

(c) The general license in paragraph (a) of this section is subject to:

(1) The provisions of parts 19, 20, 21, and §§ 40.1, 40.2a, 40.3, 40.4, 40.5, 40.6, 40.41, 40.46, 40.60, 40.61, 40.62, 40.63, 40.65, 40.71, and 40.81 of part 40 of this chapter; and

(2) The documentation of daily inspections of tailings or waste retention systems and the immediate notifica-

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tion of the appropriate NRC regional office as indicated in appendix D to part 20 of this chapter, or the Director, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555, of any failure in a tailings or waste retention system that results in a release of tailings or waste into unrestricted areas, or of any unusual conditions (conditions not contemplated in the design of the retention system) that if not corrected could lead to failure of the system and result in a release of tailings or waste into unrestricted areas; and any additional requirements the Commission may by order deem necessary. The licensee shall retain this documentation of each daily inspection as a record for three years after each inspection is documented.

(d) The general license in paragraph (a) of this section shall expire nine months from the effective date of this subparagraph unless an applicable licensee has submitted, pursuant to the provisions of § 40.31 of this part, an application for license renewal or amendment which includes a detailed program for meeting the technical and financial criteria contained in appendix A of this part.

[44 FR 50014, Aug. 24, 1979, as amended at 45 FR 12377, Feb. 26, 1980; 45 FR 65531, Oct. 3, 1980; 53 FR 19248, May 27, 1988; 56 FR 40768, Aug. 16, 1991; 73 FR 5720, Jan. 31, 2008]

**§ 40.27 General license for custody and long-term care of residual radioactive material disposal sites.**

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated under section 275(a) of the Atomic Energy Act of 1954, as amended, for disposal sites under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The license is available only to the Department of Energy, or another Federal agency designated by the President to provide long-term care. The purpose of this general license is to ensure that uranium mill tailings disposal sites will be cared for in such a

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manner as to protect the public health, safety, and the environment after remedial action has been completed.

(b) The general license in paragraph (a) of this section becomes effective when the Commission accepts a site Long-Term Surveillance Plan (LTSP) that meets the requirements of this section, and when the Commission concurs with the Department of Energy's determination of completion of remedial action at each disposal site. There is no termination of this general license. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include—

(1) A legal description of the disposal site to be licensed, including documentation on whether land and interests are owned by the United States or an Indian tribe. If the site is on Indian land, then, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Indian tribe and any person holding any interest in the land shall execute a waiver releasing the United States of any liability or claim by the Tribe or person concerning or arising from the remedial action and holding the United States harmless against any claim arising out of the performance of the remedial action;

(2) A detailed description, which can be in the form of a reference, of the final disposal site conditions, including existing ground water characterization and any necessary ground water protection activities or strategies. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. If the disposal site has continuing aquifer restoration requirements, then the licensing process will be completed in two steps. The first step includes all items other than ground water restoration. Ground water monitoring, which would be addressed in the LTSP, may still be required in this first step to assess performance of the tailings disposal units. When the Commission concurs with the

completion of ground water restoration, the licensee shall assess the need to modify the LTSP and report results to the Commission. If the proposed modifications meet the requirements of this section, the LTSP will be considered suitable to accommodate the second step.

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in appendix A, criterion 12 of this part), frequency and extent of ground water monitoring if required, appropriate constituent concentration limits for ground water, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency under the general license established by paragraph (a) of this section shall—

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) As specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Secretary of the Interior, with the concurrence of the Secretary of Energy and the Commission, may sell or lease any subsurface mineral rights associated with land on which residual radioactive materials are disposed. In such cases, the Commission shall grant a license permitting use of the land if it finds that the

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use will not disturb the residual radioactive materials or that the residual radioactive materials will be restored to a safe and environmentally sound condition if they are disturbed by the use.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

[55 FR 45598, Oct. 30, 1990]

**§ 40.28 General license for custody and long-term care of uranium or thorium byproduct materials disposal sites.**

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect the public health and safety and other actions necessary to comply with the standards in this part for uranium or thorium mill tailings sites closed under title II of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The licensee will be the Department of Energy, another Federal agency designated by the President, or a State where the disposal site is located. The purpose of this general license is to ensure that uranium and thorium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after closure.

(b) The general license in paragraph (a) of this section becomes effective when the Commission terminates, or concurs in an Agreement State's termination of, the current specific license and a site Long-Term Surveillance Plan (LTSP) meeting the requirements of this section has been accepted by the Commission. There is no termination of this general license. If the LTSP has not been formally received by the NRC prior to termination of the current specific license, the Commission may issue a specific order to the intended custodial agency to ensure continued control and surveillance of the disposal site to protect the public health, safe-

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ty, and the environment. The Commission will not unnecessarily delay the termination of the specific license solely on the basis that an acceptable LTSP has not been received. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include—

(1) A legal description of the disposal site to be transferred (unless transfer is exempted under provisions of the Atomic Energy Act, §83(b)(1)(A)) and licensed;

(2) A detailed description, which can be in the form of a reference of the final disposal site conditions, including existing ground water characterization. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs;

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in appendix A, Criterion 12 of this part), frequency and extent of ground water monitoring if required, appropriate constituent concentration limits for ground water, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency who has a general license established by paragraph (a) of this section shall—

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives

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deemed to contain the provisions set forth in sections 183b.-d., of the Act, whether or not said provisions are expressly set forth in the license.

(e) The Commission may incorporate in any license at the time of issuance, or thereafter, by appropriate rule, regulation or order, such additional requirements and conditions with respect to the licensee's receipt, possession, use, and transfer of source or byproduct material as it deems appropriate or necessary in order to:

- (1) Promote the common defense and security;
- (2) Protect health or to minimize danger of life or property;
- (3) Protect restricted data;
- (4) Require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be necessary or appropriate to effectuate the purposes of the act and regulations thereunder.

(f)(1) Each licensee shall notify the appropriate NRC Regional Administrator, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of title 11 (Bankruptcy) of the United States Code by or against:

- (i) The licensee;
  - (ii) An entity (as that term is defined in 11 U.S.C. 101(14)) controlling the licensee or listing the license or licensee as property of the estate; or
  - (iii) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.
- (2) This notification must indicate:
- (i) The bankruptcy court in which the petition for bankruptcy was filed; and
  - (ii) The date of the filing of the petition.

(g) No person may commence operation of a uranium enrichment facility until the Commission verifies through inspection that the facility has been constructed in accordance with the requirements of the license. The Commission shall publish notice of the inspection results in the FEDERAL REGISTER.

(h) Each licensee shall ensure that Safeguards Information is protected against unauthorized disclosure in accordance with the requirements in

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§ 73.21 and the requirements of § 73.22 or § 73.23 of this chapter, as applicable.

[26 FR 284, Jan. 14, 1961, as amended at 31 FR 15145, Dec. 2, 1966; 45 FR 65531, Oct. 3, 1980; 48 FR 32328, July 15, 1983; 52 FR 1295, Jan. 12, 1987; 57 FR 18391, Apr. 30, 1992; 73 FR 63571, Oct. 24, 2008]

**§ 40.42 Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.**

(a) Each specific license expires at the end of the day on the expiration date stated in the license unless the licensee has filed an application for renewal under § 40.43 not less than 30 days before the expiration date stated in the existing license. If an application for renewal has been filed at least 30 days before the expiration date stated in the existing license, the existing license expires at the end of the day on which the Commission makes a final determination to deny the renewal application or, if the determination states an expiration date, the expiration date stated in the determination.

(b) Each specific license revoked by the Commission expires at the end of the day on the date of the Commission's final determination to revoke the license, or on the expiration date stated in the determination, or as otherwise provided by Commission Order.

(c) Each specific license continues in effect, beyond the expiration date if necessary, with respect to possession of source material until the Commission notifies the licensee in writing that the license is terminated. During this time, the licensee shall—

(1) Limit actions involving source material to those related to decommissioning; and

(2) Continue to control entry to restricted areas until they are suitable for release in accordance with NRC requirements;

(d) Within 60 days of the occurrence of any of the following, consistent with the administrative directions in § 40.5, each licensee shall provide notification to the NRC in writing and either begin decommissioning its site, or any separate building or outdoor area that contains residual radioactivity, so that the building or outdoor area is suitable

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for release in accordance with NRC requirements, or submit within 12 months of notification a decommissioning plan, if required by paragraph (g)(1) of this section, and begin decommissioning upon approval of that plan if—

(1) The license has expired pursuant to paragraph (a) or (b) of this section; or

(2) The licensee has decided to permanently cease principal activities, as defined in this part, at the entire site or in any separate building or outdoor area; or

(3) No principal activities under the license have been conducted for a period of 24 months; or

(4) No principal activities have been conducted for a period of 24 months in any separate building or outdoor area that contains residual radioactivity such that the building or outdoor area is unsuitable for release in accordance with NRC requirements.

(e) Coincident with the notification required by paragraph (d) of this section, the licensee shall maintain in effect all decommissioning financial assurances established by the licensee pursuant to § 40.36 in conjunction with a license issuance or renewal or as required by this section. The amount of the financial assurance must be increased, or may be decreased, as appropriate, to cover the detailed cost estimate for decommissioning established pursuant to paragraph (g)(4)(v) of this section.

(1) Any licensee who has not provided financial assurance to cover the detailed cost estimate submitted with the decommissioning plan shall do so when this rule becomes effective November 24, 1995.

(2) Following approval of the decommissioning plan, a licensee may reduce the amount of the financial assurance as decommissioning proceeds and radiological contamination is reduced at the site with the approval of the Commission.

(f) The Commission may grant a request to delay or postpone initiation of the decommissioning process if the Commission determines that such relief is not detrimental to the public health and safety and is otherwise in the public interest. The request must

be submitted no later than 30 days before notification pursuant to paragraph (d) of this section. The schedule for decommissioning set forth in paragraph (d) of this section may not commence until the Commission has made a determination on the request.

(g)(1) A decommissioning plan must be submitted if required by license condition or if the procedures and activities necessary to carry out decommissioning of the site or separate building or outdoor area have not been previously approved by the Commission and these procedures could increase potential health and safety impacts to workers or to the public, such as in any of the following cases:

(i) Procedures would involve techniques not applied routinely during cleanup or maintenance operations;

(ii) Workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation;

(iii) Procedures could result in significantly greater airborne concentrations of radioactive materials than are present during operation; or

(iv) Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operation.

(2) The Commission may approve an alternate schedule for submittal of a decommissioning plan required pursuant to paragraph (d) of this section if the Commission determines that the alternative schedule is necessary to the effective conduct of decommissioning operations and presents no undue risk from radiation to the public health and safety and is otherwise in the public interest.

(3) The procedures listed in paragraph (g)(1) of this section may not be carried out prior to approval of the decommissioning plan.

(4) The proposed decommissioning plan for the site or separate building or outdoor area must include:

(i) A description of the conditions of the site or separate building or outdoor area sufficient to evaluate the acceptability of the plan;

(ii) A description of planned decommissioning activities;

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(iii) A description of methods used to ensure protection of workers and the environment against radiation hazards during decommissioning;

(iv) A description of the planned final radiation survey; and

(v) An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds for completion of decommissioning.

(vi) For decommissioning plans calling for completion of decommissioning later than 24 months after plan approval, a justification for the delay based on the criteria in paragraph (i) of this section.

(5) The proposed decommissioning plan will be approved by the Commission if the information therein demonstrates that the decommissioning will be completed as soon as practicable and that the health and safety of workers and the public will be adequately protected.

(h)(1) Except as provided in paragraph (i) of this section, licensees shall complete decommissioning of the site or separate building or outdoor area as soon as practicable but no later than 24 months following the initiation of decommissioning.

(2) Except as provided in paragraph (i) of this section, when decommissioning involves the entire site, the licensee shall request license termination as soon as practicable but no later than 24 months following the initiation of decommissioning.

(i) The Commission may approve a request for an alternate schedule for completion of decommissioning of the site or separate building or outdoor area, and license termination if appropriate, if the Commission determines that the alternative is warranted by consideration of the following:

(1) Whether it is technically feasible to complete decommissioning within the allotted 24-month period;

(2) Whether sufficient waste disposal capacity is available to allow completion of decommissioning within the allotted 24-month period;

(3) Whether a significant volume reduction in wastes requiring disposal

will be achieved by allowing short-lived radionuclides to decay;

(4) Whether a significant reduction in radiation exposure to workers can be achieved by allowing short-lived radionuclides to decay; and

(5) Other site-specific factors which the Commission may consider appropriate on a case-by-case basis, such as the regulatory requirements of other government agencies, lawsuits, groundwater treatment activities, monitored natural ground-water restoration, actions that could result in more environmental harm than deferred cleanup, and other factors beyond the control of the licensee.

(j) As the final step in decommissioning, the licensee shall—

(1) Certify the disposition of all licensed material, including accumulated wastes, by submitting a completed NRC Form 314 or equivalent information; and

(2) Conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey, unless the licensee demonstrates in some other manner that the premises are suitable for release in accordance with the criteria for decommissioning in 10 CFR part 20, subpart E or, for uranium milling (uranium and thorium recovery) facilities, Criterion 6(6) of Appendix A to this part. The licensee shall, as appropriate—

(i) Report levels of gamma radiation in units of millisieverts (micro-roentgen) per hour at one meter from surfaces, and report levels of radioactivity, including alpha and beta, in units of megabecquerels (disintegrations per minute or microcuries) per 100 square centimeters removable and fixed for surfaces, megabecquerels (microcuries) per milliliter for water, and becquerels (picocuries) per gram for solids such as soils or concrete; and

(ii) Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.

(k) Specific licenses, including expired licenses, will be terminated by written notice to the licensee when the Commission determines that:

(1) Source material has been properly disposed;

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(2) Reasonable effort has been made to eliminate residual radioactive contamination, if present; and

(3)(i) A radiation survey has been performed which demonstrates that the premises are suitable for release in accordance with the criteria for decommissioning in 10 CFR part 20, subpart E or, for (uranium and thorium recovery) facilities, Criterion 6(6) of Appendix A to this part; or

(ii) Other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release in accordance with the criteria for decommissioning in 10 CFR part 20, subpart E or, for uranium milling (uranium and thorium recovery) facilities, Criterion 6(6) of Appendix A to this part.

(4) Records required by §40.61 (d) and (f) have been received.

(1) Specific licenses for uranium and thorium milling are exempt from paragraphs (d)(4), (g) and (h) of this section with respect to reclamation of tailings impoundments and/or waste disposal areas.

[59 FR 36035, July 15, 1994, as amended at 60 FR 38239, July 26, 1995; 61 FR 1114, Jan. 16, 1996; 61 FR 24674, May 16, 1996; 61 FR 29637, June 12, 1996; 62 FR 39090, July 21, 1997; 66 FR 64738, Dec. 14, 2001; 68 FR 75390, Dec. 31, 2003; 73 FR 42674, July 23, 2008]

**§40.43 Renewal of licenses.**

Application for renewal of a specific license must be filed on NRC Form 313 and in accordance with §40.31.

[75 FR 73943, Nov. 30, 2010]

**§40.44 Amendment of licenses at request of licensee.**

Applications for amendment of a license shall be filed on NRC Form 313 in accordance with §40.31 and shall specify the respects in which the licensee desires the license to be amended and the grounds for such amendment.

[49 FR 19627, May 9, 1984, as amended at 56 FR 40768, Aug. 16, 1991]

**§40.45 Commission action on applications to renew or amend.**

In considering an application by a licensee to renew or amend his license

the Commission will apply the applicable criteria set forth in §40.32.

[26 FR 284, Jan. 14, 1961, as amended at 43 FR 6924, Feb. 17, 1978]

**§40.46 Inalienability of licenses.**

No license issued or granted pursuant to the regulations in this part shall be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person, unless the Commission shall after securing full information, find that the transfer is in accordance with the provisions of this act, and shall give its consent in writing.

**TRANSFER OF SOURCE MATERIAL****§40.51 Transfer of source or byproduct material.**

(a) No licensee shall transfer source or byproduct material except as authorized pursuant to this section.

(b) Except as otherwise provided in his license and subject to the provisions of paragraphs (c) and (d) of this section, any licensee may transfer source or byproduct material:

(1) To the Department of Energy;

(2) To the agency in any Agreement State which regulates radioactive materials pursuant to an agreement with the Commission or the Atomic Energy Commission under section 274 of the Act;

(3) To any person exempt from the licensing requirements of the Act and regulations in this part, to the extent permitted under such exemption;

(4) To any person in an Agreement State subject to the jurisdiction of that State who has been exempted from the licensing requirements and regulations of that State, to the extent permitted under such exemptions;

(5) To any person authorized to receive such source or byproduct material under terms of a specific license or a general license or their equivalents issued by the Commission or an Agreement State;

(6) To any person abroad pursuant to an export license issued under part 110 of this chapter; or

(7) As otherwise authorized by the commission in writing.

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(2) On or before July 26, 1990, each holder of an operating license for a production or utilization facility in effect on July 27, 1990, shall submit information in the form of a report as described in § 50.75 of this part, indicating how reasonable assurance will be provided that funds will be available to decommission the facility.

[21 FR 355, Jan. 19, 1956, as amended at 35 FR 19660, Dec. 29, 1970; 38 FR 3956, Feb. 9, 1973; 45 FR 55408, Aug. 19, 1980; 49 FR 35752, Sept. 12, 1984; 53 FR 24049, June 27, 1988; 69 FR 4448, Jan. 30, 2004; 72 FR 49490, Aug. 28, 2007]

**§ 50.34 Contents of applications; technical information.**

(a) *Preliminary safety analysis report.* Each application for a construction permit shall include a preliminary safety analysis report. The minimum information<sup>5</sup> to be included shall consist of the following:

(1) Stationary power reactor applicants for a construction permit who apply on or after January 10, 1997, shall comply with paragraph (a)(1)(ii) of this section. All other applicants for a construction permit shall comply with paragraph (a)(1)(i) of this section.

(i) A description and safety assessment of the site on which the facility is to be located, with appropriate attention to features affecting facility design. Special attention should be directed to the site evaluation factors identified in part 100 of this chapter. The assessment must contain an analysis and evaluation of the major structures, systems and components of the facility which bear significantly on the acceptability of the site under the site evaluation factors identified in part 100 of this chapter, assuming that the facility will be operated at the ultimate power level which is contemplated by the applicant. With respect to operation at the projected initial power level, the applicant is required to submit information prescribed in paragraphs (a)(2) through (a)(8) of this section, as well as the information required by this paragraph, in support of

the application for a construction permit, or a design approval.

(ii) A description and safety assessment of the site and a safety assessment of the facility. It is expected that reactors will reflect through their design, construction and operation an extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products. The following power reactor design characteristics and proposed operation will be taken into consideration by the Commission:

(A) Intended use of the reactor including the proposed maximum power level and the nature and inventory of contained radioactive materials;

(B) The extent to which generally accepted engineering standards are applied to the design of the reactor;

(C) The extent to which the reactor incorporates unique, unusual or enhanced safety features having a significant bearing on the probability or consequences of accidental release of radioactive materials;

(D) The safety features that are to be engineered into the facility and those barriers that must be breached as a result of an accident before a release of radioactive material to the environment can occur. Special attention must be directed to plant design features intended to mitigate the radiological consequences of accidents. In performing this assessment, an applicant shall assume a fission product release<sup>6</sup> from the core into the containment assuming that the facility is operated at the ultimate power level contemplated. The applicant shall perform an evaluation and analysis of the postulated fission product release, using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate the consequences of the accidents, together with applicable site characteristics, including site meteorology, to

<sup>5</sup>The applicant may provide information required by this paragraph in the form of a discussion, with specific references, of similarities to and differences from, facilities of similar design for which applications have previously been filed with the Commission.

<sup>6</sup>The fission product release assumed for this evaluation should be based upon a major accident, hypothesized for purposes of site analysis or postulated from considerations of possible accidental events. Such accidents have generally been assumed to result in substantial meltdown of the core with subsequent release into the containment of appreciable quantities of fission products.

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evaluate the offsite radiological consequences. Site characteristics must comply with part 100 of this chapter. The evaluation must determine that:

(1) An individual located at any point on the boundary of the exclusion area for any 2 hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem<sup>7</sup> total effective dose equivalent (TEDE).

(2) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE);

(E) With respect to operation at the projected initial power level, the applicant is required to submit information prescribed in paragraphs (a)(2) through (a)(8) of this section, as well as the information required by paragraph (a)(1)(i) of this section, in support of the application for a construction permit.

(2) A summary description and discussion of the facility, with special attention to design and operating characteristics, unusual or novel design features, and principal safety considerations.

(3) The preliminary design of the facility including:

(i) The principal design criteria for the facility.<sup>8</sup> appendix A, General De-

<sup>7</sup> A whole body dose of 25 rem has been stated to correspond numerically to the once in a lifetime accidental or emergency dose for radiation workers which, according to NCRP recommendations at the time could be disregarded in the determination of their radiation exposure status (see NBS Handbook 69 dated June 5, 1959). However, its use is not intended to imply that this number constitutes an acceptable limit for an emergency dose to the public under accident conditions. Rather, this dose value has been set forth in this section as a reference value, which can be used in the evaluation of plant design features with respect to postulated reactor accidents, in order to assure that such designs provide assurance of low risk of public exposure to radiation, in the event of such accidents.

<sup>8</sup> General design criteria for chemical processing facilities are being developed.

<sup>9</sup> [Reserved]

sign Criteria for Nuclear Power Plants, establishes minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have previously been issued by the Commission and provides guidance to applicants for construction permits in establishing principal design criteria for other types of nuclear power units;

(ii) The design bases and the relation of the design bases to the principal design criteria;

(iii) Information relative to materials of construction, general arrangement, and approximate dimensions, sufficient to provide reasonable assurance that the final design will conform to the design bases with adequate margin for safety.

(4) A preliminary analysis and evaluation of the design and performance of structures, systems, and components of the facility with the objective of assessing the risk to public health and safety resulting from operation of the facility and including determination of the margins of safety during normal operations and transient conditions anticipated during the life of the facility, and the adequacy of structures, systems, and components provided for the prevention of accidents and the mitigation of the consequences of accidents. Analysis and evaluation of ECCS cooling performance and the need for high point vents following postulated loss-of-coolant accidents must be performed in accordance with the requirements of § 50.46 and § 50.46a of this part for facilities for which construction permits may be issued after December 28, 1974.

(5) An identification and justification for the selection of those variables, conditions, or other items which are determined as the result of preliminary safety analysis and evaluation to be probable subjects of technical specifications for the facility, with special attention given to those items which may significantly influence the final design: *Provided, however*, That this requirement is not applicable to an application for a construction permit filed prior to January 16, 1969.

(6) A preliminary plan for the applicant's organization, training of personnel, and conduct of operations.

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(7) A description of the quality assurance program to be applied to the design, fabrication, construction, and testing of the structures, systems, and components of the facility. Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," sets forth the requirements for quality assurance programs for nuclear power plants and fuel reprocessing plants. The description of the quality assurance program for a nuclear power plant or a fuel reprocessing plant shall include a discussion of how the applicable requirements of appendix B will be satisfied.

(8) An identification of those structures, systems, or components of the facility, if any, which require research and development to confirm the adequacy of their design; and identification and description of the research and development program which will be conducted to resolve any safety questions associated with such structures, systems or components; and a schedule of the research and development program showing that such safety questions will be resolved at or before the latest date stated in the application for completion of construction of the facility.

(9) The technical qualifications of the applicant to engage in the proposed activities in accordance with the regulations in this chapter.

(10) A discussion of the applicant's preliminary plans for coping with emergencies. Appendix E sets forth items which shall be included in these plans.

(11) On or after February 5, 1979, applicants who apply for construction permits for nuclear power plants to be built on multiunit sites shall identify potential hazards to the structures, systems and components important to safety of operating nuclear facilities from construction activities. A discussion shall also be included of any managerial and administrative controls that will be used during construction to assure the safety of the operating unit.

(12) On or after January 10, 1997, stationary power reactor applicants who apply for a construction permit, as partial conformance to General Design Criterion 2 of appendix A to this part,

shall comply with the earthquake engineering criteria in appendix S to this part.

(13) On or after July 13, 2009, stationary power reactor applicants who apply for a construction permit shall submit the information required by 10 CFR 50.150(b) as a part of their preliminary safety analysis report.

(b) *Final safety analysis report.* Each application for an operating license shall include a final safety analysis report. The final safety analysis report shall include information that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components and of the facility as a whole, and shall include the following:

(1) All current information, such as the results of environmental and meteorological monitoring programs, which has been developed since issuance of the construction permit, relating to site evaluation factors identified in part 100 of this chapter.

(2) A description and analysis of the structures, systems, and components of the facility, with emphasis upon performance requirements, the bases, with technical justification therefor, upon which such requirements have been established, and the evaluations required to show that safety functions will be accomplished. The description shall be sufficient to permit understanding of the system designs and their relationship to safety evaluations.

(i) For nuclear reactors, such items as the reactor core, reactor coolant system, instrumentation and control systems, electrical systems, containment system, other engineered safety features, auxiliary and emergency systems, power conversion systems, radioactive waste handling systems, and fuel handling systems shall be discussed insofar as they are pertinent.

(ii) For facilities other than nuclear reactors, such items as the chemical, physical, metallurgical, or nuclear process to be performed, instrumentation and control systems, ventilation and filter systems, electrical systems, auxiliary and emergency systems, and radioactive waste handling systems shall be discussed insofar as they are pertinent.

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(3) The kinds and quantities of radioactive materials expected to be produced in the operation and the means for controlling and limiting radioactive effluents and radiation exposures within the limits set forth in part 20 of this chapter.

(4) A final analysis and evaluation of the design and performance of structures, systems, and components with the objective stated in paragraph (a)(4) of this section and taking into account any pertinent information developed since the submittal of the preliminary safety analysis report. Analysis and evaluation of ECCS cooling performance following postulated loss-of-coolant accidents shall be performed in accordance with the requirements of § 50.46 for facilities for which a license to operate may be issued after December 28, 1974.

(5) A description and evaluation of the results of the applicant's programs, including research and development, if any, to demonstrate that any safety questions identified at the construction permit stage have been resolved.

(6) The following information concerning facility operation:

(i) The applicant's organizational structure, allocations or responsibilities and authorities, and personnel qualifications requirements.

(ii) Managerial and administrative controls to be used to assure safe operation. Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," sets forth the requirements for such controls for nuclear power plants and fuel reprocessing plants. The information on the controls to be used for a nuclear power plant or a fuel reprocessing plant shall include a discussion of how the applicable requirements of appendix B will be satisfied.

(iii) Plans for preoperational testing and initial operations.

(iv) Plans for conduct of normal operations, including maintenance, surveillance, and periodic testing of structures, systems, and components.

(v) Plans for coping with emergencies, which shall include the items specified in appendix E.

(vi) Proposed technical specifications prepared in accordance with the requirements of § 50.36.

(vii) On or after February 5, 1979, applicants who apply for operating licenses for nuclear power plants to be operated on multiunit sites shall include an evaluation of the potential hazards to the structures, systems, and components important to safety of operating units resulting from construction activities, as well as a description of the managerial and administrative controls to be used to provide assurance that the limiting conditions for operation are not exceeded as a result of construction activities at the multiunit sites.

(7) The technical qualifications of the applicant to engage in the proposed activities in accordance with the regulations in this chapter.

(8) A description and plans for implementation of an operator requalification program. The operator requalification program must as a minimum, meet the requirements for those programs contained in § 55.59 of part 55 of this chapter.

(9) A description of protection provided against pressurized thermal shock events, including projected values of the reference temperature for reactor vessel beltline materials as defined in § 50.61 (b)(1) and (b)(2).

(10) On or after January 10, 1997, stationary power reactor applicants who apply for an operating license, as partial conformance to General Design Criterion 2 of appendix A to this part, shall comply with the earthquake engineering criteria of appendix S to this part. However, for those operating license applicants and holders whose construction permit was issued before January 10, 1997, the earthquake engineering criteria in Section VI of appendix A to part 100 of this chapter continues to apply.

(11) On or after January 10, 1997, stationary power reactor applicants who apply for an operating license, shall provide a description and safety assessment of the site and of the facility as in § 50.34(a)(1)(ii). However, for either an operating license applicant or holder whose construction permit was issued before January 10, 1997, the reactor site criteria in part 100 of this chapter and the seismic and geologic siting criteria in appendix A to part 100 of this chapter continues to apply.

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(12) On or after July 13, 2009, stationary power reactor applicants who apply for an operating license which is subject to 10 CFR 50.150(a) shall submit the information required by 10 CFR 50.150(b) as a part of their final safety analysis report.

(c) *Physical security plan.* (1) Each applicant for an operating license for a production or utilization facility that will be subject to §§ 73.50 and 73.60 of this chapter must include a physical security plan.

(2) Each applicant for an operating license for a utilization facility that will be subject to the requirements of § 73.55 of this chapter must include a physical security plan, a training and qualification plan in accordance with the criteria set forth in appendix B to part 73 of this chapter, and a cyber security plan in accordance with the criteria set forth in § 73.54 of this chapter.

(3) The physical security plan must describe how the applicant will meet the requirements of part 73 of this chapter (and part 11 of this chapter, if applicable, including the identification and description of jobs as required by § 11.11(a) of this chapter, at the proposed facility). Security plans must list tests, inspections, audits, and other means to be used to demonstrate compliance with the requirements of 10 CFR parts 11 and 73, if applicable.

(d) *Safeguards contingency plan.* (1) Each application for a license to operate a production or utilization facility that will be subject to §§ 73.50 and 73.60 of this chapter must include a licensee safeguards contingency plan in accordance with the criteria set forth in section I of appendix C to part 73 of this chapter. The "implementation procedures" required per section I of appendix C to part 73 of this chapter do not have to be submitted to the Commission for approval.

(2) Each application for a license to operate a utilization facility that will be subject to § 73.55 of this chapter must include a licensee safeguards contingency plan in accordance with the criteria set forth in section II of appendix C to part 73 of this chapter. The "implementing procedures" required in section II of appendix C to part 73 of this chapter do not have to be submitted to the Commission for approval.

(e) *Protection against unauthorized disclosure.* Each applicant for an operating license for a production or utilization facility, who prepares a physical security plan, a safeguards contingency plan, a training and qualification plan, or a cyber security plan, shall protect the plans and other related Safeguards Information against unauthorized disclosure in accordance with the requirements of § 73.21 of this chapter.

(f) *Additional TMI-related requirements.* In addition to the requirements of paragraph (a) of this section, each applicant for a light-water-reactor construction permit or manufacturing license whose application was pending as of February 16, 1982, shall meet the requirements in paragraphs (f)(1) through (3) of this section. This regulation applies to the pending applications by Duke Power Company (Perkins Nuclear Station, Units 1, 2, and 3), Houston Lighting & Power Company (Allens Creek Nuclear Generating Station, Unit 1), Portland General Electric Company (Pebble Springs Nuclear Plant, Units 1 and 2), Public Service Company of Oklahoma (Black Fox Station, Units 1 and 2), Puget Sound Power & Light Company (Skagit/Hanford Nuclear Power Project, Units 1 and 2), and Offshore Power Systems (License to Manufacture Floating Nuclear Plants). The number of units that will be specified in the manufacturing license above, if issued, will be that number whose start of manufacture, as defined in the license application, can practically begin within a 10-year period commencing on the date of issuance of the manufacturing license, but in no event will that number be in excess of ten. The manufacturing license will require the plant design to be updated no later than 5 years after its approval. Paragraphs (f)(1)(xii), (2)(ix), and (3)(v) of this section, pertaining to hydrogen control measures, must be met by all applicants covered by this regulation. However, the Commission may decide to impose additional requirements and the issue of whether compliance with these provisions, together with 10 CFR 50.44 and criterion 50 of appendix A to 10 CFR part 50, is sufficient for issuance of that manufacturing license which may

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be considered in the manufacturing license proceeding. In addition, each applicant for a design certification, design approval, combined license, or manufacturing license under part 52 of this chapter shall demonstrate compliance with the technically relevant portions of the requirements in paragraphs (f)(1) through (3) of this section, except for paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v).

(1) To satisfy the following requirements, the application shall provide sufficient information to describe the nature of the studies, how they are to be conducted, estimated submittal dates, and a program to ensure that the results of these studies are factored into the final design of the facility. For licensees identified in the introduction to paragraph (f) of this section, all studies must be completed no later than 2 years following the issuance of the construction permit or manufacturing license.<sup>10</sup> For all other applicants, the studies must be submitted as part of the final safety analysis report.

(i) Perform a plant/site specific probabilistic risk assessment, the aim of which is to seek such improvements in the reliability of core and containment heat removal systems as are significant and practical and do not impact excessively on the plant. (II.B.8)

(ii) Perform an evaluation of the proposed auxiliary feedwater system (AFWS), to include (applicable to PWR's only) (II.E.1.1):

(A) A simplified AFWS reliability analysis using event-tree and fault-tree logic techniques.

(B) A design review of AFWS.

(C) An evaluation of AFWS flow design bases and criteria.

(iii) Perform an evaluation of the potential for and impact of reactor coolant pump seal damage following small-break LOCA with loss of offsite power. If damage cannot be precluded, provide an analysis of the limiting small-break loss-of-coolant accident with subsequent reactor coolant pump seal damage. (II.K.2.16 and II.K.3.25)

<sup>10</sup> Alphanumeric designations correspond to the related action plan items in NUREG 0718 and NUREG-0660, "NRC Action Plan Developed as a Result of the TMI-2 Accident." They are provided herein for information only.

(iv) Perform an analysis of the probability of a small-break loss-of-coolant accident (LOCA) caused by a stuck-open power-operated relief valve (PORV). If this probability is a significant contributor to the probability of small-break LOCA's from all causes, provide a description and evaluation of the effect on small-break LOCA probability of an automatic PORV isolation system that would operate when the reactor coolant system pressure falls after the PORV has opened. (Applicable to PWR's only). (II.K.3.2)

(v) Perform an evaluation of the safety effectiveness of providing for separation of high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) system initiation levels so that the RCIC system initiates at a higher water level than the HPCI system, and of providing that both systems restart on low water level. (For plants with high pressure core spray systems in lieu of high pressure coolant injection systems, substitute the words, "high pressure core spray" for "high pressure coolant injection" and "HPCS" for "HPCT") (Applicable to BWR's only). (II.K.3.13)

(vi) Perform a study to identify practicable system modifications that would reduce challenges and failures of relief valves, without compromising the performance of the valves or other systems. (Applicable to BWR's only). (II.K.3.16)

(vii) Perform a feasibility and risk assessment study to determine the optimum automatic depressurization system (ADS) design modifications that would eliminate the need for manual activation to ensure adequate core cooling. (Applicable to BWR's only). (II.K.3.18)

(viii) Perform a study of the effect on all core-cooling modes under accident conditions of designing the core spray and low pressure coolant injection systems to ensure that the systems will automatically restart on loss of water level, after having been manually stopped, if an initiation signal is still present. (Applicable to BWR's only). (II.K.3.21)

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(ix) Perform a study to determine the need for additional space cooling to ensure reliable long-term operation of the reactor core isolation cooling (RCIC) and high-pressure coolant injection (HPCI) systems, following a complete loss of offsite power to the plant for at least two (2) hours. (For plants with high pressure core spray systems in lieu of high pressure coolant injection systems, substitute the words, "high pressure core spray" for "high pressure coolant injection" and "HPCS" for "HPCI") (Applicable to BWR's only). (II.K.3.24)

(x) Perform a study to ensure that the Automatic Depressurization System, valves, accumulators, and associated equipment and instrumentation will be capable of performing their intended functions during and following an accident situation, taking no credit for non-safety related equipment or instrumentation, and accounting for normal expected air (or nitrogen) leakage through valves. (Applicable to BWR's only). (II.K.3.28)

(xi) Provide an evaluation of depressurization methods, other than by full actuation of the automatic depressurization system, that would reduce the possibility of exceeding vessel integrity limits during rapid cooldown. (Applicable to BWR's only) (II.K.3.45)

(xii) Perform an evaluation of alternative hydrogen control systems that would satisfy the requirements of paragraph (f)(2)(ix) of this section. As a minimum include consideration of a hydrogen ignition and post-accident inerting system. The evaluation shall include:

(A) A comparison of costs and benefits of the alternative systems considered.

(B) For the selected system, analyses and test data to verify compliance with the requirements of (f)(2)(ix) of this section.

(C) For the selected system, preliminary design descriptions of equipment, function, and layout.

(2) To satisfy the following requirements, the application shall provide sufficient information to demonstrate

that the required actions will be satisfactorily completed by the operating license stage. This information is of the type customarily required to satisfy 10 CFR 50.35(a)(2) or to address unresolved generic safety issues.

(i) Provide simulator capability that correctly models the control room and includes the capability to simulate small-break LOCA's. (Applicable to construction permit applicants only) (I.A.4.2.)

(ii) Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, reliability analyses, human factors engineering, crisis management, operator training, and coordination with INPO and other industry efforts. (Applicable to construction permit applicants only) (I.C.9)

(iii) Provide, for Commission review, a control room design that reflects state-of-the-art human factor principles prior to committing to fabrication or revision of fabricated control room panels and layouts. (I.D.1)

(iv) Provide a plant safety parameter display console that will display to operators a minimum set of parameters defining the safety status of the plant, capable of displaying a full range of important plant parameters and data trends on demand, and capable of indicating when process limits are being approached or exceeded. (I.D.2)

(v) Provide for automatic indication of the bypassed and operable status of safety systems. (I.D.3)

(vi) Provide the capability of high point venting of noncondensable gases from the reactor coolant system, and other systems that may be required to maintain adequate core cooling. Systems to achieve this capability shall be capable of being operated from the control room and their operation shall not lead to an unacceptable increase in the probability of loss-of-coolant accident or an unacceptable challenge to containment integrity. (II.B.1)

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(vii) Perform radiation and shielding design reviews of spaces around systems that may, as a result of an accident, contain accident source term<sup>11</sup> radioactive materials, and design as necessary to permit adequate access to important areas and to protect safety equipment from the radiation environment. (II.B.2)

(viii) Provide a capability to promptly obtain and analyze samples from the reactor coolant system and containment that may contain accident source term<sup>11</sup> radioactive materials without radiation exposures to any individual exceeding 5 rems to the whole body or 50 rems to the extremities. Materials to be analyzed and quantified include certain radionuclides that are indicators of the degree of core damage (e.g., noble gases, radioiodines and cesiums, and nonvolatile isotopes), hydrogen in the containment atmosphere, dissolved gases, chloride, and boron concentrations. (II.B.3)

(ix) Provide a system for hydrogen control that can safely accommodate hydrogen generated by the equivalent of a 100% fuel-clad metal water reaction. Preliminary design information on the tentatively preferred system option of those being evaluated in paragraph (f)(1)(xii) of this section is sufficient at the construction permit stage. The hydrogen control system and associated systems shall provide, with reasonable assurance, that: (II.B.8)

(A) Uniformly distributed hydrogen concentrations in the containment do not exceed 10% during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100% fuel clad metal-water reaction, or that the post-accident atmosphere will not support hydrogen combustion.

(B) Combustible concentrations of hydrogen will not collect in areas

where unintended combustion or detonation could cause loss of containment integrity or loss of appropriate mitigating features.

(C) Equipment necessary for achieving and maintaining safe shutdown of the plant and maintaining containment integrity will perform its safety function during and after being exposed to the environmental conditions attendant with the release of hydrogen generated by the equivalent of a 100% fuel-clad metal water reaction including the environmental conditions created by activation of the hydrogen control system.

(D) If the method chosen for hydrogen control is a post-accident inerting system, inadvertent actuation of the system can be safely accommodated during plant operation.

(x) Provide a test program and associated model development and conduct tests to qualify reactor coolant system relief and safety valves and, for PWR's, PORV block valves, for all fluid conditions expected under operating conditions, transients and accidents. Consideration of anticipated transients without scram (ATWS) conditions shall be included in the test program. Actual testing under ATWS conditions need not be carried out until subsequent phases of the test program are developed. (II.D.1)

(xi) Provide direct indication of relief and safety valve position (open or closed) in the control room. (II.D.3)

(xii) Provide automatic and manual auxiliary feedwater (AFW) system initiation, and provide auxiliary feedwater system flow indication in the control room. (Applicable to PWR's only) (II.E.1.2)

(xiii) Provide pressurizer heater power supply and associated motive and control power interfaces sufficient to establish and maintain natural circulation in hot standby conditions with only onsite power available. (Applicable to PWR's only) (II.E.3.1)

(xiv) Provide containment isolation systems that: (II.E.4.2)

(A) Ensure all non-essential systems are isolated automatically by the containment isolation system,

(B) For each non-essential penetration (except instrument lines) have two isolation barriers in series,

<sup>11</sup>The fission product release assumed for these calculations should be based upon a major accident, hypothesized for purposes of site analysis or postulated from considerations of possible accidental events, that would result in potential hazards not exceeded by those from any accident considered credible. Such accidents have generally been assumed to result in substantial meltdown of the core with subsequent release of appreciable quantities of fission products.

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(C) Do not result in reopening of the containment isolation valves on resetting of the isolation signal,

(D) Utilize a containment set point pressure for initiating containment isolation as low as is compatible with normal operation,

(E) Include automatic closing on a high radiation signal for all systems that provide a path to the environs.

(xv) Provide a capability for containment purging/venting designed to minimize the purging time consistent with ALARA principles for occupational exposure. Provide and demonstrate high assurance that the purge system will reliably isolate under accident conditions. (II.E.4.4)

(xvi) Establish a design criterion for the allowable number of actuation cycles of the emergency core cooling system and reactor protection system consistent with the expected occurrence rates of severe overcooling events (considering both anticipated transients and accidents). (Applicable to B&W designs only). (II.E.5.1)

(xvii) Provide instrumentation to measure, record and readout in the control room: (A) containment pressure, (B) containment water level, (C) containment hydrogen concentration, (D) containment radiation intensity (high level), and (E) noble gas effluents at all potential, accident release points. Provide for continuous sampling of radioactive iodines and particulates in gaseous effluents from all potential accident release points, and for onsite capability to analyze and measure these samples. (II.F.1)

(xviii) Provide instruments that provide in the control room an unambiguous indication of inadequate core cooling, such as primary coolant saturation meters in PWR's, and a suitable combination of signals from indicators of coolant level in the reactor vessel and in-core thermocouples in PWR's and BWR's. (II.F.2)

(xix) Provide instrumentation adequate for monitoring plant conditions following an accident that includes core damage. (II.F.3)

(xx) Provide power supplies for pressurizer relief valves, block valves, and level indicators such that: (A) Level indicators are powered from vital buses; (B) motive and control power connec-

tions to the emergency power sources are through devices qualified in accordance with requirements applicable to systems important to safety and (C) electric power is provided from emergency power sources. (Applicable to PWR's only). (II.G.1)

(xxi) Design auxiliary heat removal systems such that necessary automatic and manual actions can be taken to ensure proper functioning when the main feedwater system is not operable. (Applicable to BWR's only). (II.K.1.22)

(xxii) Perform a failure modes and effects analysis of the integrated control system (ICS) to include consideration of failures and effects of input and output signals to the ICS. (Applicable to B&W-designed plants only). (II.K.2.9)

(xxiii) Provide, as part of the reactor protection system, an anticipatory reactor trip that would be actuated on loss of main feedwater and on turbine trip. (Applicable to B&W-designed plants only). (II.K.2.10)

(xxiv) Provide the capability to record reactor vessel water level in one location on recorders that meet normal post-accident recording requirements. (Applicable to BWR's only). (II.K.3.23)

(xxv) Provide an onsite Technical Support Center, an onsite Operational Support Center, and, for construction permit applications only, a nearsite Emergency Operations Facility. (III.A.1.2).

(xxvi) Provide for leakage control and detection in the design of systems outside containment that contain (or might contain) accident source term<sup>11</sup> radioactive materials following an accident. Applicants shall submit a leakage control program, including an initial test program, a schedule for retesting these systems, and the actions to be taken for minimizing leakage from such systems. The goal is to minimize potential exposures to workers and public, and to provide reasonable assurance that excessive leakage will not prevent the use of systems needed in an emergency. (III.D.1.1)

(xxvii) Provide for monitoring of inplant radiation and airborne radioactivity as appropriate for a broad range of routine and accident conditions. (III.D.3.3)

(xxviii) Evaluate potential pathways for radioactivity and radiation that

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may lead to control room habitability problems under accident conditions resulting in an accident source term<sup>11</sup> release, and make necessary design provisions to preclude such problems. (III.D.3.4)

(3) To satisfy the following requirements, the application shall provide sufficient information to demonstrate that the requirement has been met. This information is of the type customarily required to satisfy paragraph (a)(1) of this section or to address the applicant's technical qualifications and management structure and competence.

(i) Provide administrative procedures for evaluating operating, design and construction experience and for ensuring that applicable important industry experiences will be provided in a timely manner to those designing and constructing the plant. (I.C.5)

(ii) Ensure that the quality assurance (QA) list required by Criterion II, app. B, 10 CFR part 50 includes all structures, systems, and components important to safety. (I.F.1)

(iii) Establish a quality assurance (QA) program based on consideration of: (A) Ensuring independence of the organization performing checking functions from the organization responsible for performing the functions; (B) performing quality assurance/quality control functions at construction sites to the maximum feasible extent; (C) including QA personnel in the documented review of and concurrence in quality related procedures associated with design, construction and installation; (D) establishing criteria for determining QA programmatic requirements; (E) establishing qualification requirements for QA and QC personnel; (F) sizing the QA staff commensurate with its duties and responsibilities; (G) establishing procedures for maintenance of "as-built" documentation; and (H) providing a QA role in design and analysis activities. (I.F.2)

(iv) Provide one or more dedicated containment penetrations, equivalent in size to a single 3-foot diameter opening, in order not to preclude future installation of systems to prevent containment failure, such as a filtered vented containment system. (II.B.8)

(v) Provide preliminary design information at a level of detail consistent with that normally required at the construction permit stage of review sufficient to demonstrate that: (II.B.8)

(A)(1) Containment integrity will be maintained (i.e., for steel containments by meeting the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsubarticle NE-3220, Service Level C Limits, except that evaluation of instability is not required, considering pressure and dead load alone. For concrete containments by meeting the requirements of the ASME Boiler Pressure Vessel Code, Section III, Division 2 Subsubarticle CC-3720, Factored Load Category, considering pressure and dead load alone) during an accident that releases hydrogen generated from 100% fuel clad metal-water reaction accompanied by either hydrogen burning or the added pressure from post-accident inerting assuming carbon dioxide is the inerting agent. As a minimum, the specific code requirements set forth above appropriate for each type of containment will be met for a combination of dead load and an internal pressure of 45 psig. Modest deviations from these criteria will be considered by the staff, if good cause is shown by an applicant. Systems necessary to ensure containment integrity shall also be demonstrated to perform their function under these conditions.

(2) Subarticle NE-3220, Division 1, and subarticle CC-3720, Division 2, of section III of the July 1, 1980 ASME Boiler and Pressure Vessel Code, which are referenced in paragraphs (f)(3)(v)(A)(1) and (f)(3)(v)(B)(1) of this section, were approved for incorporation by reference by the Director of the Office of the Federal Register. A notice of any changes made to the material incorporated by reference will be published in the FEDERAL REGISTER. Copies of the ASME Boiler and Pressure Vessel Code may be purchased from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th St., New York, NY 10017. It is also available for inspection at the NRC Library, 11545 Rockville Pike, Rockville, Maryland 20852-2738.

(B)(1) Containment structure loadings produced by an inadvertent full

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actuation of a post-accident inerting hydrogen control system (assuming carbon dioxide), but not including seismic or design basis accident loadings will not produce stresses in steel containments in excess of the limits set forth in the ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsubarticle NE-3220, Service Level A Limits, except that evaluation of instability is not required (for concrete containments the loadings specified above will not produce strains in the containment liner in excess of the limits set forth in the ASME Boiler and Pressure Vessel Code, Section III, Division 2, Subsubarticle CC-3720, Service Load Category, (2) The containment has the capability to safely withstand pressure tests at 1.10 and 1.15 times (for steel and concrete containments, respectively) the pressure calculated to result from carbon dioxide inerting.

(vi) For plant designs with external hydrogen recombiners, provide redundant dedicated containment penetrations so that, assuming a single failure, the recombiner systems can be connected to the containment atmosphere. (II.E.4.1)

(vii) Provide a description of the management plan for design and construction activities, to include: (A) The organizational and management structure singularly responsible for direction of design and construction of the proposed plant; (B) technical resources director by the applicant; (C) details of the interaction of design and construction within the applicant's organization and the manner by which the applicant will ensure close integration of the architect engineer and the nuclear steam supply vendor; (D) proposed procedures for handling the transition to operation; (E) the degree of top level management oversight and technical control to be exercised by the applicant during design and construction, including the preparation and implementation of procedures necessary to guide the effort. (II.J.3.1)

(g) *Combustible gas control.* All applicants for a reactor construction permit or operating license whose application is submitted after October 16, 2003, shall include the analyses, and the descriptions of the equipment and sys-

tems required by § 50.44 as a part of their application.

(h) *Conformance with the Standard Review Plan (SRP).* (1)(i) Applications for light water cooled nuclear power plant operating licenses docketed after May 17, 1982 shall include an evaluation of the facility against the Standard Review Plan (SRP) in effect on May 17, 1982 or the SRP revision in effect six months prior to the docket date of the application, whichever is later.

(ii) Applications for light-water-cooled nuclear power plant construction permits docketed after May 17, 1982, shall include an evaluation of the facility against the SRP in effect on May 17, 1982, or the SRP revision in effect six months before the docket date of the application, whichever is later.

(2) The evaluation required by this section shall include an identification and description of all differences in design features, analytical techniques, and procedural measures proposed for a facility and those corresponding features, techniques, and measures given in the SRP acceptance criteria. Where such a difference exists, the evaluation shall discuss how the alternative proposed provides an acceptable method of complying with those rules or regulations of Commission, or portions thereof, that underlie the corresponding SRP acceptance criteria.

(3) The SRP was issued to establish criteria that the NRC staff intends to use in evaluating whether an applicant/licensee meets the Commission's regulations. The SRP is not a substitute for the regulations, and compliance is not a requirement. Applicants shall identify differences from the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP criteria provide an acceptable method of complying with the Commission's regulations.

(i) A description and plans for implementation of the guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with the loss of large areas of the plant due to explosions or fire as required by § 50.54(hh)(2) of this chapter.

[33 FR 18612, Dec. 17, 1968]

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EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 50.34, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at [www.fdsys.gov](http://www.fdsys.gov).

**§ 50.34a Design objectives for equipment to control releases of radioactive material in effluents—nuclear power reactors.**

(a) An application for a construction permit shall include a description of the preliminary design of equipment to be installed to maintain control over radioactive materials in gaseous and liquid effluents produced during normal reactor operations, including expected operational occurrences. In the case of an application filed on or after January 2, 1971, the application shall also identify the design objectives, and the means to be employed, for keeping levels of radioactive material in effluents to unrestricted areas as low as is reasonably achievable. The term "as low as is reasonably achievable" as used in this part means as low as is reasonably achievable taking into account the state of technology, and the economics of improvements in relation to benefits to the public health and safety and other societal and socioeconomic considerations, and in relation to the use of atomic energy in the public interest. The guides set out in appendix I to this part provide numerical guidance on design objectives for light-water-cooled nuclear power reactors to meet the requirements that radioactive material in effluents released to unrestricted areas be kept as low as is reasonably achievable. These numerical guides for design objectives and limiting conditions for operation are not to be construed as radiation protection standards.

(b) Each application for a construction permit shall include:

(1) A description of the preliminary design of equipment to be installed under paragraph (a) of this section;

(2) An estimate of:

(i) The quantity of each of the principal radionuclides expected to be released annually to unrestricted areas in liquid effluents produced during normal reactor operations; and

(ii) The quantity of each of the principal radionuclides of the gases, halides, and particulates expected to be

released annually to unrestricted areas in gaseous effluents produced during normal reactor operations.

(3) A general description of the provisions for packaging, storage, and shipment offsite of solid waste containing radioactive materials resulting from treatment of gaseous and liquid effluents and from other sources.

(c) Each application for an operating license shall include:

(1) A description of the equipment and procedures for the control of gaseous and liquid effluents and for the maintenance and use of equipment installed in radioactive waste systems, under paragraph (a) of this section; and

(2) A revised estimate of the information required in paragraph (b)(2) of this section if the expected releases and exposures differ significantly from the estimates submitted in the application for a construction permit.

(d) Each application for a combined license under part 52 of this chapter shall include:

(1) A description of the equipment and procedures for the control of gaseous and liquid effluents and for the maintenance and use of equipment installed in radioactive waste systems, under paragraph (a) of this section; and

(2) The information required in paragraph (b)(2) of this section.

(e) Each application for a design approval, a design certification, or a manufacturing license under part 52 of this chapter shall include:

(1) A description of the equipment for the control of gaseous and liquid effluents and for the maintenance and use of equipment installed in radioactive waste systems, under paragraph (a) of this section; and

(2) The information required in paragraph (b)(2) of this section.

[72 FR 49492, Aug. 28, 2007]

**§ 50.35 Issuance of construction permits.<sup>1</sup>**

(a) When an applicant has not supplied initially all of the technical information required to complete the application and support the issuance of a

<sup>1</sup> The Commission may issue a provisional construction permit pursuant to the regulations in this part in effect on March 30, 1970,

*Continued*

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**§ 50.66 Requirements for thermal annealing of the reactor pressure vessel.**

(a) For those light water nuclear power reactors where neutron radiation has reduced the fracture toughness of the reactor vessel materials, a thermal annealing may be applied to the reactor vessel to recover the fracture toughness of the material. The use of a thermal annealing treatment is subject to the requirements in this section. A report describing the licensee's plan for conducting the thermal annealing must be submitted in accordance with § 50.4 at least three years prior to the date at which the limiting fracture toughness criteria in § 50.61 or appendix G to part 50 would be exceeded. Within three years of the submittal of the Thermal Annealing Report and at least thirty days prior to the start of the thermal annealing, the NRC will review the Thermal Annealing Report and make available the results of its evaluation at the NRC Web site, <http://www.nrc.gov>. The licensee may begin the thermal anneal after:

(1) Submitting the Thermal Annealing Report required by paragraph (b) of this section;

(2) The NRC makes available the results of its evaluation of the Thermal Annealing Report at the NRC Web site, <http://www.nrc.gov>; and

(3) The requirements of paragraph (f)(1) of this section have been satisfied.

(b) *Thermal Annealing Report.* The Thermal Annealing Report must include: a Thermal Annealing Operating Plan; a Requalification Inspection and Test Program; a Fracture Toughness Recovery and Reembrittlement Trend Assurance Program; and an Identification of Changes Requiring a License Amendment.

(1) *Thermal Annealing Operating Plan.* The thermal annealing operating plan must include:

(i) A detailed description of the pressure vessel and all structures and components that are expected to experience significant thermal or stress effects during the thermal annealing operation;

(ii) An evaluation of the effects of mechanical and thermal stresses and temperatures on the vessel, contain-

ment, biological shield, attached piping and appurtenances, and adjacent equipment and components to demonstrate that operability of the reactor will not be detrimentally affected. This evaluation must include:

(A) Detailed thermal and structural analyses to establish the time and temperature profile of the annealing operation. These analyses must include heatup and cooldown rates, and must demonstrate that localized temperatures, thermal stress gradients, and subsequent residual stresses will not result in unacceptable dimensional changes or distortions in the vessel, attached piping and appurtenances, and that the thermal annealing cycle will not result in unacceptable degradation of the fatigue life of these components.

(B) The effects of localized high temperatures on degradation of the concrete adjacent to the vessel and changes in thermal and mechanical properties, if any, of the reactor vessel insulation, and on detrimental effects, if any, on containment and the biological shield. If the design temperature limitations for the adjacent concrete structure are to be exceeded during the thermal annealing operation, an acceptable maximum temperature for the concrete must be established for the annealing operation using appropriate test data.

(iii) The methods, including heat source, instrumentation and procedures proposed for performing the thermal annealing. This shall include any special precautions necessary to minimize occupational exposure, in accordance with the As Low As Reasonably Achievable (ALARA) principle and the provisions of § 20.1206.

(iv) The proposed thermal annealing operating parameters, including bounding conditions for temperatures and times, and heatup and cooldown schedules.

(A) The thermal annealing time and temperature parameters selected must be based on projecting sufficient recovery of fracture toughness, using the procedures of paragraph (e) of this section, to satisfy the requirements of § 50.60 and § 50.61 for the proposed period of operation addressed in the application.

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(B) The time and temperature parameters evaluated as part of the thermal annealing operating plan, and supported by the evaluation results of paragraph (b)(1)(ii) of this section, represent the bounding times and temperatures for the thermal annealing operation. If these bounding conditions for times and temperatures are violated during the thermal annealing operation, then the annealing operation is considered not in accordance with the Thermal Annealing Operating Plan, as required by paragraph (c)(1) of this section, and the licensee must comply with paragraph (c)(2) of this section.

(2) *Requalification Inspection and Test Program.* The inspection and test program to requalify the annealed reactor vessel must include the detailed monitoring, inspections, and tests proposed to demonstrate that the limitations on temperatures, times and temperature profiles, and stresses evaluated for the proposed thermal annealing conditions of paragraph (b)(1)(iv) of this section have not been exceeded, and to determine the thermal annealing time and temperature to be used in quantifying the fracture toughness recovery. The requalification inspection and test program must demonstrate that the thermal annealing operation has not degraded the reactor vessel, attached piping or appurtenances, or the adjacent concrete structures to a degree that could affect the safe operation of the reactor.

(3) *Fracture Toughness Recovery and Reembrittlement Trend Assurance Program.* The percent recovery of  $RT_{NDT}$  and Charpy upper-shelf energy due to the thermal annealing treatment must be determined based on the time and temperature of the actual vessel thermal anneal. The recovery of  $RT_{NDT}$  and Charpy upper-shelf energy provide the basis for establishing the post-anneal  $RT_{NDT}$  and Charpy upper-shelf energy for each vessel material. Changes in the  $RT_{NDT}$  and Charpy upper-shelf energy with subsequent plant operation must be determined using the post-anneal values of these parameters in conjunction with the projected re-embrittlement trend determined in accordance with paragraph (b)(3)(i) of

this section. Recovery and re-embrittlement evaluations shall include:

(i) *Recovery Evaluations.* (A) The percent recovery of both  $RT_{NDT}$  and Charpy upper-shelf energy must be determined by one of the procedures described in paragraph (e) of this section, using the proposed lower bound thermal annealing time and temperature conditions described in the operating plan.

(B) If the percent recovery is determined from testing surveillance specimens or from testing materials removed from the reactor vessel, then it shall be demonstrated that the proposed thermal annealing parameters used in the test program are equal to or bounded by those used in the vessel annealing operation.

(C) If generic computational methods are used, appropriate justification must be submitted as a part of the application.

(ii) *Reembrittlement Evaluations.* (A) The projected post-anneal re-embrittlement of  $RT_{NDT}$  must be calculated using the procedures in §50.61(c), or must be determined using the same basis as that used for the pre-anneal operating period. The projected change due to post-anneal re-embrittlement for Charpy upper-shelf energy must be determined using the same basis as that used for the pre-anneal operating period.

(B) The post-anneal re-embrittlement trend of both  $RT_{NDT}$  and Charpy upper-shelf energy must be estimated, and must be monitored using a surveillance program defined in the Thermal Annealing Report and which conforms to the intent of appendix H of this part, "Reactor Vessel Material Surveillance Program Requirements."

(4) *Identification of Changes Requiring a License Amendment.* Any changes to the facility as described in the final safety analysis report (as updated) which requires a license amendment pursuant to §50.59(c)(2) of this part, and any changes to the Technical Specifications, which are necessary to either conduct the thermal annealing or to operate the nuclear power reactor following the annealing must be identified. The section shall demonstrate that the Commission's requirements continue to be complied with, and that

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there is reasonable assurance of adequate protection to the public health and safety following the changes.

(c) *Completion or Termination of Thermal Annealing.* (1) If the thermal annealing was completed in accordance with the Thermal Annealing Operating Plan and the Requalification Inspection and Test Program, the licensee shall so confirm in writing to the Director, Office of Nuclear Reactor Regulation. The licensee may restart its reactor after the requirements of paragraph (f)(2) of this section have been met.

(2) If the thermal annealing was completed but the annealing was not performed in accordance with the Thermal Annealing Operating Plan and the Requalification Inspection and Test Program, the licensee shall submit a summary of lack of compliance with the Thermal Annealing Operating Plan and the Requalification Inspection and Test Program and a justification for subsequent operation to the Director, Office of Nuclear Reactor Regulation. Any changes to the facility as described in the final safety analysis report (as updated) which are attributable to the noncompliances and which require a license amendment pursuant to § 50.59(c)(2) and any changes to the Technical Specifications shall also be identified.

(i) If no changes requiring a license amendment pursuant to § 50.59(c)(2) or changes to Technical Specifications are identified, the licensee may restart its reactor after the requirements of paragraph (f)(2) of this section have been met:

(ii) If any changes requiring a license amendment pursuant to § 50.59(c)(2) or changes to the Technical Specifications are identified, the licensee may not restart its reactor until approval is obtained from the Director, Office of Nuclear Reactor Regulation and the requirements of paragraph (f)(2) of this section have been met.

(3) If the thermal annealing was terminated prior to completion, the licensee shall immediately notify the NRC of the premature termination of the thermal anneal.

(4) If the partial annealing was otherwise performed in accordance with the Thermal Annealing Operating Plan and

relevant portions of the Requalification Inspection and Test Program, and the licensee does not elect to take credit for any recovery, the licensee need not submit the Thermal Annealing Results Report required by paragraph (d) of this section but instead shall confirm in writing to the Director, Office of Nuclear Reactor Regulation that the partial annealing was otherwise performed in accordance with the Thermal Annealing Operating Plan and relevant portions of the Requalification Inspection and Test Program. The licensee may restart its reactor after the requirements of paragraph (f)(2) of this section have been met.

(ii) If the partial annealing was otherwise performed in accordance with the Thermal Annealing Operating Plan and relevant portions of the Requalification Inspection and Test Program, and the licensee elects to take full or partial credit for the partial annealing, the licensee shall confirm in writing to the Director, Office of Nuclear Reactor Regulation that the partial annealing was otherwise performed in compliance with the Thermal Annealing Operating Plan and relevant portions of the Requalification Inspection and Test Program. The licensee may restart its reactor after the requirements of paragraph (f)(2) of this section have been met.

(iii) If the partial annealing was not performed in accordance with the Thermal Annealing Operating Plan and the Requalification Inspection and Test Program, the licensee shall submit a summary of lack of compliance with the Thermal Annealing Operating Plan and the Requalification Inspection and Test Program and a justification for subsequent operation to the Director, Office of Nuclear Reactor Regulation. Any changes to the facility as described in the final safety analysis report (as updated) which are attributable to the noncompliances and which require a license amendment pursuant to § 50.59(c)(2) and any changes to the technical specifications which are required as a result of the noncompliances, shall also be identified.

(A) If no changes requiring a license amendment pursuant to § 50.59(c)(2) or

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changes to Technical Specifications are identified, the licensee may restart its reactor after the requirements of paragraph (f)(2) of this section have been met.

(B) If any changes requiring a license amendment pursuant to § 50.59(c)(2) or changes to Technical Specifications are identified, the licensee may not restart its reactor until approval is obtained from the Director, Office of Nuclear Reactor Regulation and the requirements of paragraph (f)(2) of this section have been met.

(d) *Thermal Annealing Results Report.* Every licensee that either completes a thermal annealing, or that terminates an annealing but elects to take full or partial credit for the annealing, shall provide the following information within three months of completing the thermal anneal, unless an extension is authorized by the Director, Office of Nuclear Reactor Regulation:

(1) The time and temperature profiles of the actual thermal annealing;

(2) The post-anneal  $RT_{NDT}$  and Charpy upper-shelf energy values of the reactor vessel materials for use in subsequent reactor operation;

(3) The projected post-anneal re-embrittlement trends for both  $RT_{NDT}$  and Charpy upper-shelf energy; and

(4) The projected values of  $RT_{PTs}$  and Charpy upper-shelf energy at the end of the proposed period of operation addressed in the Thermal Annealing Report.

(e) *Procedures for Determining the Recovery of Fracture Toughness.* The procedures of this paragraph must be used to determine the percent recovery of  $\Delta RT_{NDT}$ ,  $R_t$ , and percent recovery of Charpy upper-shelf energy,  $R_u$ . In all cases,  $R_t$  and  $R_u$  may not exceed 100.

(1) For those reactors with surveillance programs which have developed credible surveillance data as defined in § 50.61, percent recovery due to thermal annealing ( $R_t$  and  $R_u$ ) must be evaluated by testing surveillance specimens that have been withdrawn from the surveillance program and that have been annealed under the same time and temperature conditions as those given the beltline material.

(2) Alternatively, the percent recovery due to thermal annealing ( $R_t$  and  $R_u$ ) may be determined from the results

of a verification test program employing materials removed from the beltline region of the reactor vessel<sup>6</sup> and that have been annealed under the same time and temperature conditions as those given the beltline material.

(3) Generic computational methods may be used to determine recovery if adequate justification is provided.

(f) *Public information and participation.* (1) Upon receipt of a Thermal Annealing Report, and a minimum of 30 days before the licensee starts thermal annealing, the Commission shall:

(i) Notify and solicit comments from local and State governments in the vicinity of the site where the thermal annealing will take place and any Indian Nation or other indigenous people that have treaty or statutory rights that could be affected by the thermal annealing,

(ii) Publish a notice of a public meeting in the FEDERAL REGISTER and in a forum, such as local newspapers, which is readily accessible to individuals in the vicinity of the site, to solicit comments from the public, and

(iii) Hold a public meeting on the licensee's Thermal Annealing Report.

(2) Within 15 days after the NRC's receipt of the licensee submissions required by paragraphs (c)(1), (c)(2) and (c)(3)(i) through (iii) of this section, the NRC staff shall make available at the NRC Web site, <http://www.nrc.gov>, a summary of its inspection of the licensee's thermal annealing, and the Commission shall hold a public meeting:

(i) For the licensee to explain to NRC and the public the results of the reactor pressure vessel annealing,

(ii) for the NRC to discuss its inspection of the reactor vessel annealing, and

(iii) for the NRC to receive public comments on the annealing.

(3) Within 45 days of NRC's receipt of the licensee submissions required by paragraphs (c)(1), (c)(2) and (c)(3)(i) through (iii) of this section, the NRC

<sup>6</sup>For those cases where materials are removed from the beltline of the pressure vessel, the stress limits of the applicable portions of the ASME Code Section III must be satisfied, including consideration of fatigue and corrosion, regardless of the Code of record for the vessel design.

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staff shall complete full documentation of its inspection of the licensee's annealing process and make available this documentation at the NRC Web site, <http://www.nrc.gov>.

[60 FR 65472, Dec. 19, 1995, as amended at 64 FR 48952, Sept. 9, 1999; 64 FR 53613, Oct. 4, 1999]

EFFECTIVE DATE NOTE: See 64 FR 53582, Oct. 4, 1999, for effectiveness of § 50.66 (b) introductory text, paragraphs (b)(4), (c)(2), and (c)(3)(iii).

**§ 50.67 Accident source term.**

(a) *Applicability.* The requirements of this section apply to all holders of operating licenses issued prior to January 10, 1997, and holders of renewed licenses under part 54 of this chapter whose initial operating license was issued prior to January 10, 1997, who seek to revise the current accident source term used in their design basis radiological analyses.

(b) *Requirements.* (1) A licensee who seeks to revise its current accident source term in design basis radiological consequence analyses shall apply for a license amendment under § 50.90. The application shall contain an evaluation of the consequences of applicable design basis accidents<sup>1</sup> previously analyzed in the safety analysis report.

(2) The NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:

(i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem)<sup>2</sup> total effective dose equivalent (TEDE).

<sup>1</sup>The fission product release assumed for these calculations should be based upon a major accident, hypothesized for purposes of design analyses or postulated from considerations of possible accidental events, that would result in potential hazards not exceeded by those from any accident considered credible. Such accidents have generally been assumed to result in substantial meltdown of the core with subsequent release of appreciable quantities of fission products.

<sup>2</sup>The use of 0.25 Sv (25 rem) TEDE is not intended to imply that this value constitutes an acceptable limit for emergency doses to

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(ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE).

(iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) total effective dose equivalent (TEDE) for the duration of the accident.

[64 FR 72001, Dec. 23, 1999]

**§ 50.68 Criticality accident requirements.**

(a) Each holder of a construction permit or operating license for a nuclear power reactor issued under this part or a combined license for a nuclear power reactor issued under part 52 of this chapter, shall comply with either 10 CFR 70.24 of this chapter or the requirements in paragraph (b) of this section.

(b) Each licensee shall comply with the following requirements in lieu of maintaining a monitoring system capable of detecting a criticality as described in 10 CFR 70.24:

(1) Plant procedures shall prohibit the handling and storage at any one time of more fuel assemblies than have been determined to be safely subcritical under the most adverse moderation conditions feasible by unborated water.

(2) The estimated ratio of neutron production to neutron absorption and leakage (k-effective) of the fresh fuel in the fresh fuel storage racks shall be calculated assuming the racks are loaded with fuel of the maximum fuel assembly reactivity and flooded with unborated water and must not exceed

the public under accident conditions. Rather, this 0.25 Sv (25 rem) TEDE value has been stated in this section as a reference value, which can be used in the evaluation of proposed design basis changes with respect to potential reactor accidents of exceedingly low probability of occurrence and low risk of public exposure to radiation.

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Subparts K and L are also issued under sec. 133, 98 Stat. 2230 (42 U.S.C. 10153) and sec. 218(a), 96 Stat. 2252 (42 U.S.C. 10198).

SOURCE: 53 FR 31658, Aug. 19, 1988, unless otherwise noted.

**Subpart A—General Provisions****§ 72.1 Purpose.**

The regulations in this part establish requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel, power reactor-related Greater than Class C (GTCC) waste, and other radioactive materials associated with spent fuel storage in an independent spent fuel storage installation (ISFSI) and the terms and conditions under which the Commission will issue these licenses. The regulations in this part also establish requirements, procedures, and criteria for the issuance of licenses to the Department of Energy (DOE) to receive, transfer, package, and possess power reactor spent fuel, high-level radioactive waste, power reactor-related GTCC waste, and other radioactive materials associated with the storage of these materials in a monitored retrievable storage installation (MRS). The term Monitored Retrievable Storage Installation or MRS, as defined in § 72.3, is derived from the Nuclear Waste Policy Act (NWPA) and includes any installation that meets this definition. The regulations in this part also establish requirements, procedures, and criteria for the issuance of Certificates of Compliance approving spent fuel storage cask designs.

[66 FR 51838, Oct. 11, 2001]

**§ 72.2 Scope.**

(a) Except as provided in § 72.6(b), licenses issued under this part are limited to the receipt, transfer, packaging, and possession of:

(1) Power reactor spent fuel to be stored in a complex that is designed and constructed specifically for storage of power reactor spent fuel aged for at least one year, other radioactive materials associated with spent fuel storage, and power reactor-related GTCC waste in a solid form in an independent spent fuel storage installation (ISFSI); or

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(2) Power reactor spent fuel to be stored in a monitored retrievable storage installation (MRS) owned by DOE that is designed and constructed specifically for the storage of spent fuel aged for at least one year, high-level radioactive waste that is in a solid form, other radioactive materials associated with storage of these materials, and power reactor-related GTCC waste that is in a solid form.

(b) The regulations in this part pertaining to an independent spent fuel storage installation (ISFSI) and a spent fuel storage cask apply to all persons in the United States, including persons in Agreement States. The regulations in this part pertaining to a monitored retrievable storage installation (MRS) apply only to DOE.

(c) The requirements of this regulation are applicable, as appropriate, to both wet and dry modes of storage of—

(1) Spent fuel and solid reactor-related GTCC waste in an independent spent fuel storage installation (ISFSI); and

(2) Spent fuel, solid high-level radioactive waste, and solid reactor-related GTCC waste in a monitored retrievable storage installation (MRS).

(d) Licenses covering the storage of spent fuel in an existing spent fuel storage installation shall be issued in accordance with the requirements of this part as stated in § 72.40, as applicable.

(e) This part also gives notice to all persons who knowingly provide to any licensee, certificate holder, applicant for a license or certificate, contractor, or subcontractor, components, equipment, materials, or other goods or services, that relate to a licensee's, certificate holder's, or applicant's activities subject to this part, that they may be individually subject to NRC enforcement action for violation of § 72.12.

(f) Certificates of Compliance approving spent fuel storage cask designs shall be issued in accordance with the requirements of subpart L of this part.

[53 FR 31658, Aug. 19, 1988, as amended at 56 FR 40692, Aug. 15, 1991; 63 FR 1900, Jan. 13, 1998; 64 FR 33183, June 22, 1999; 64 FR 56121, Oct. 15, 1999; 66 FR 51838, Oct. 11, 2001]

**§ 72.3 Definitions.**

As used in this part:

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Act means the Atomic Energy Act of 1954 (68 Stat. 919) including any amendments thereto.

*Affected Indian tribe* means any Indian tribe—

(1) Within whose reservation boundaries a monitored retrievable storage facility is proposed to be located;

(2) Whose federally defined possessory or usage rights to other lands outside of the reservation's boundaries arising out of congressionally ratified treaties may be substantially and adversely affected by the locating of such a facility: *Provided*, That the Secretary of the Interior finds, upon the petition of the appropriate governmental officials of the tribe, that such effects are both substantial and adverse to the tribe.

*Affected unit of local government* means any unit of local government with jurisdiction over the site where an MRS is proposed to be located.

*As low as is reasonably achievable (ALARA)* means as low as is reasonably achievable taking into account the state of technology, and the economics of improvement in relation to—

(1) Benefits to the public health and safety,

(2) Other societal and socioeconomic considerations, and

(3) The utilization of atomic energy in the public interest.

*Atomic energy* means all forms of energy released in the course of nuclear fission or nuclear transformation.

*Byproduct material* means—

(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material;

(2)(i) Any discrete 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; or

(ii) Any material that—

(A) Has been made radioactive by use of a particle accelerator; and

(B) Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and

(3) Any discrete source of naturally occurring radioactive material, other than source material, that—

(i) The Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate Federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and

(ii) Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

*Certificate holder* means a person who has been issued a Certificate of Compliance by the Commission for a spent fuel storage cask design.

*Certificate of Compliance* or *CoC* means the certificate issued by the Commission that approves the design of a spent fuel storage cask in accordance with the provisions of subpart L of this part.

*Commencement of construction* means any clearing of land, excavation, or other substantial action that would adversely affect the natural environment of a site, but does not mean:

(1) Changes desirable for the temporary use of the land for public recreational uses, necessary borings or excavations to determine subsurface materials and foundation conditions, or other preconstruction monitoring to establish background information related to the suitability of the site or to the protection of environmental values;

(2) Construction of environmental monitoring facilities;

(3) Procurement or manufacture of components of the installation; or

(4) Construction of means of access to the site as may be necessary to accomplish the objectives of paragraphs (1) and (2) of this definition.

*Commission* means the Nuclear Regulatory Commission or its duly authorized representatives.

*Confinement systems* means those systems, including ventilation, that act as barriers between areas containing radioactive substances and the environment.

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*Controlled area* means that area immediately surrounding an ISFSI or MRS for which the licensee exercises authority over its use and within which ISFSI or MRS operations are performed.

*Decommission* means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits—

(1) Release of the property for unrestricted use and termination of the license; or

(2) Release of the property under restricted conditions and termination of the license.

*Design bases* means that information that identifies the specific functions to be performed by a structure, system, or component of a facility or of a spent fuel storage cask and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be restraints derived from generally accepted state-of-the-art practices for achieving functional goals or requirements derived from analysis (based on calculation or experiments) of the effects of a postulated event under which a structure, system, or component must meet its functional goals. The values for controlling parameters for external events include—

(1) Estimates of severe natural events to be used for deriving design bases that will be based on consideration of historical data on the associated parameters, physical data, or analysis of upper limits of the physical processes involved; and

(2) Estimates of severe external man-induced events to be used for deriving design bases that will be based on analysis of human activity in the region, taking into account the site characteristics and the risks associated with the event.

*Design capacity* means the quantity of spent fuel, high-level radioactive waste, or reactor-related GTCC waste, the maximum burn up of the spent fuel in MWD/MTU, the terabequerel (curie) content of the waste, and the total heat generation in Watts (btu/hour) that the storage installation is designed to accommodate.

*DOE* means the U.S. Department of Energy or its duly authorized representatives.

*Floodplain* means the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands. Areas subject to a one percent or greater chance of flooding in any given year are included.

*Greater than Class C waste or GTCC waste* means low-level radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in § 61.55 of this chapter.

*High-level radioactive waste or HLW* means (1) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (2) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.

*Historical data* means a compilation of the available published and unpublished information concerning a particular type of event.

*Independent spent fuel storage installation or ISFSI* means a complex designed and constructed for the interim storage of spent nuclear fuel, solid reactor-related GTCC waste, and other radioactive materials associated with spent fuel and reactor-related GTCC waste storage. An ISFSI which is located on the site of another facility licensed under this part or a facility licensed under part 50 of this chapter and which shares common utilities and services with that facility or is physically connected with that other facility may still be considered independent.

*Indian Tribe* means an Indian tribe as defined in the Indian Self Determination and Education Assistance Act (Pub. L. 93-638).

*Monitored Retrievable Storage Installation or MRS* means a complex designed, constructed, and operated by DOE for the receipt, transfer, handling, packaging, possession, safeguarding, and storage of spent nuclear fuel aged for at least one year, solidified high-level

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radioactive waste resulting from civilian nuclear activities, and solid reactor-related GTCC waste, pending shipment to a HLW repository or other disposal.

*NEPA* means the National Environmental Policy Act of 1969 including any amendments thereto.

*NWPA* means the Nuclear Waste Policy Act of 1982 including any amendments thereto.

*Person* means—

(1) Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission or the Department of Energy (DOE), except that the DOE shall be considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974, as amended (88 Stat. 1244), and Sections 131, 132, 133, 135, 137, and 141 of the Nuclear Waste Policy Act of 1982 (96 Stat. 2229, 2230, 2232, 2241);

(2) Any State, any political subdivision of a State, or any political entity within a State;

(3) Any foreign government or nation, or any political subdivision of any such government or nation, or other entity; and

(4) Any legal successor, representative, agent, or agency of the foregoing.

*Population* means the people that may be affected by the change in environmental conditions due to the construction, operation, or decommissioning of an ISFSI or MRS.

*Principal activities*, as used in this part, means activities authorized by the license which are essential to achieving the purpose(s) for which the license was issued or amended, excluding activities incidental to decontamination or decommissioning.

*Reconciliation* means the process of evaluating and comparing licensee reports required under this part to the projected material balances generated by the Nuclear Materials Management and Safeguards System. This process is considered complete when the licensee resolves any differences between the reported and projected balances, in-

cluding those listed for foreign obligated materials.

*Region* means the geographical area surrounding and including the site, which is large enough to contain all the features related to a phenomenon or to a particular event that could potentially impact the safe or environmentally sound construction, operation, or decommissioning of an independent spent fuel storage or monitored retrievable storage installation.

*Reservation* means—

(1) Any Indian reservation or dependent Indian community referred to in clause (a) or (b) of section 1151 of title 18, United States Code; or

(2) Any land selected by an Alaska Native village or regional corporation under the provisions of the Alaska Native Claims Settlement Act (43 U.S.C. 1601 *et seq.*).

*Site* means the real property on which the ISFSI or MRS is located.

*Source material* means—

(1) Uranium or thorium, or any combination thereof, in any physical or chemical form or

(2) Ores that contain by weight one-twentieth of one percent (0.05%) or more of:

(i) Uranium,

(ii) Thorium, or

(iii) Any combination thereof.

Source material does not include special nuclear material.

*Special nuclear material* means—

(1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or

(2) Any material artificially enriched by any of the foregoing but does not include source material.

*Spent fuel storage cask* or *cask* means all the components and systems associated with the container in which spent fuel or other radioactive materials associated with spent fuel are stored in an ISFSI.

*Spent nuclear fuel* or *Spent fuel* means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least one year's decay since being used as a source of energy

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in a power reactor, and has not been chemically separated into its constituent elements by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies.

*Structures, systems, and components important to safety* means those features of the ISFSI, MRS, and spent fuel storage cask whose functions are—

(1) To maintain the conditions required to store spent fuel, high-level radioactive waste, or reactor-related GTCC waste safely;

(2) To prevent damage to the spent fuel, the high-level radioactive waste, or reactor-related GTCC waste container during handling and storage; or

(3) To provide reasonable assurance that spent fuel, high-level radioactive waste, or reactor-related GTCC waste can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public.

[53 FR 31658, Aug. 19, 1988, as amended at 59 FR 36038, July 15, 1994; 62 FR 39092, July 21, 1997; 64 FR 53614, Oct. 4, 1999; 64 FR 56121, Oct. 15, 1999; 66 FR 51839, Oct. 11, 2001; 72 FR 55933, Oct. 1, 2007; 73 FR 32462, June 9, 2008]

**§ 72.4 Communications.**

Except where otherwise specified, all communications and reports concerning the regulations in this part and applications filed under them should be sent by mail addressed: ATTN: Document Control Desk, Director, Division of Spent Fuel Storage and Transportation, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; by hand delivery to the NRC's offices at One White Flint North, 11555 Rockville Pike, Rockville, Maryland between 7:30 a.m. and 4:15 p.m. eastern time; or, where practicable, by electronic submission, for example, via Electronic Information Exchange, or CD-ROM. Electronic submissions must be made in a manner that enables the NRC to receive, read, authenticate, distribute, and archive the submission, and process and retrieve it a single page at a time. Detailed guidance on making electronic submissions can be obtained by visiting the NRC's Web site at [http://](http://www.nrc.gov/site-help/e-submittals.html)

[www.nrc.gov/site-help/e-submittals.html](http://www.nrc.gov/site-help/e-submittals.html); by e-mail to [MSHD.Resource@nrc.gov](mailto:MSHD.Resource@nrc.gov); or by writing the Office of Information Services, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. The guidance discusses, among other topics, the formats the NRC can accept, the use of electronic signatures, and the treatment of nonpublic information. If the submission deadline date falls on a Saturday, or Sunday, or a Federal holiday, the next Federal working day becomes the official due date.

[68 FR 58818, Oct. 10, 2003, as amended at 74 FR 62684, Dec. 1, 2009; 75 FR 73945, Nov. 30, 2010]

**§ 72.5 Interpretations.**

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by an officer or employee of the Commission, other than a written interpretation by the General Counsel, will be recognized to be binding upon the Commission.

**§ 72.6 License required; types of licenses.**

(a) Licenses for the receipt, handling, storage, and transfer of spent fuel or high-level radioactive waste are of two types: general and specific. Licenses for the receipt, handling, storage, and transfer of reactor-related GTCC are specific licenses. Any general license provided in this part is effective without the filing of an application with the Commission or the issuance of a licensing document to a particular person. A specific license is issued to a named person upon application filed pursuant to regulations in this part.

(b) A general license is hereby issued to receive title to and own spent fuel, high-level radioactive waste, or reactor-related GTCC waste without regard to quantity. Notwithstanding any other provision of this chapter, a general licensee under this paragraph is not authorized to acquire, deliver, receive, possess, use, or transfer spent fuel, high-level radioactive waste, or reactor-related GTCC waste except as authorized in a specific license.

(c) Except as authorized in a specific license and in a general license under subpart K of this part issued by the

## New Jersey Administrative Code Currentness

## Title 7. Department of Environmental Protection

■ Chapter 26C. Administrative Requirements for the Remediation of Contaminated Sites (ARRCS) Rules  
(Refs & Annos)

## → Subchapter 7. Remedial Action Permits

## → 7:26C-7.1 Purpose and scope

(a) The purpose of this subchapter is to establish a permit program for implementing remedial actions that require institutional or engineering controls, or that include operation and maintenance systems.

(b) More specifically, this subchapter establishes:

## 1. A regulatory mechanism for the:

i. Operation and maintenance of certain remedial actions;

ii. Monitoring the effectiveness of certain remedial actions; and

iii. Submission of biennial certifications of engineering and institutional controls;

2. The permittees of a remedial action permit, pursuant to N.J.A.C. 7:26C-7.2;

3. Remedial action permits, pursuant to N.J.A.C. 7:26C-7.3;

4. The general conditions that apply to each remedial action permit, pursuant to N.J.A.C. 7:26C-7.4;

5. The specific conditions that apply to each soil remedial action permit involving a deed notice, pursuant to N.J.A.C. 7:26C-7.5;

6. The specific conditions that apply to each ground water remedial action permit, pursuant to N.J.A.C. 7:26C-7.6;

7. The financial assurance requirements for a remedial action permit that include an engineering control, pursuant to N.J.A.C. 7:26C-7.7;

8. The procedures for transferring a remedial action permit, pursuant to N.J.A.C. 7:26C-7.8;

9. The procedures for the Department to modify a remedial action permit, pursuant to N.J.A.C. 7:26C-7.9; and

10. The procedures for the Department to terminate a remedial action permit, pursuant to N.J.A.C. 7:26C-7.10.

(c) A remedial action permit pursuant to this subchapter does not:

1. Authorize any person to discharge any pollutant or hazardous substance; or
2. Relieve any person from the obligation to comply with all other applicable Federal, State, and local laws, rules, and regulations.

→ **7:26C-7.2 Permittees of remedial action permits**

(a) Each of the following persons shall comply with this subchapter, including any applicable remedial action permit the Department issues pursuant to this subchapter:

1. The permittees for a remedial action permit include, without limitation, each of the following statutory permittees:

- i. Each owner and operator of an underground storage tank facility who is liable for the remediation pursuant to the Underground Storage of Hazardous Substances Act, N.J.S.A. 58:10A-21 et seq.;
- ii. Each owner and operator of an industrial establishment who is liable for the remediation pursuant to Industrial Site Recovery Act, N.J.S.A. 13:1K-6 et seq.; and
- iii. Any other person in any way responsible, pursuant to the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq., for any hazardous substance that was discharged; and
- iv. Any other person who is remediating a site; and

2. The permittees for a remedial action permit also include certain persons due to their position as owners, operators, or tenants of the property that is being, or has been remediated, including, without limitation, each of the following:

- i. Each owner of the property, where the discharge occurred, at the time of implementation of the remedial action that includes an engineering or institutional control or operation and maintenance require-

ments for the remedial action; and

ii. Each subsequent owner, operator and tenant of the property of the discharge during that person's ownership or operation.

(b) If more than one person is responsible for compliance with a remedial action permit pursuant to (a) above, each such person, as a co-permittee, is jointly and severally liable for:

1. Compliance with the conditions of a remedial action permit pursuant to this subchapter;
2. Payment of all remedial action permit fees pursuant to N.J.A.C. 7:26C-4;
3. Payment of penalties for violations of a remedial action permit pursuant to N.J.A.C. 7:26C-9; and
4. Maintenance of financial assurance for engineering controls pursuant to N.J.A.C. 7:26C-7.7.

→ **7:26C-7.3 Remedial action permits**

(a) The Department will issue a remedial action permit pursuant to this subchapter whenever the Department receives, after January 15, 2010, any of the following as part of a remedial action:

1. A copy of a deed notice stamped as being properly recorded and a completed form, found on the Department's website at [www.nj.gov/dep/srp/srra/forms](http://www.nj.gov/dep/srp/srra/forms); and
2. A ground water workplan that includes:
  - i. Natural attenuation as part of the remedial action;
  - ii. An engineering control as part of the remedial action; or
  - iii. Requirements for monitoring, maintenance and evaluation of any institutional or engineering control as part of the remedial action.

→ **7:26C-7.4 General conditions applicable to all remedial action permits**

(a) The permittees for a remedial action permit shall comply with all maintenance, monitoring, and evaluation requirements in any or all of the following that pertain to the remediation that is the subject of the permit:

1. Every remedial action workplan and remedial action report that either the Department or a licensed site remediation professional has approved;
2. Every final remediation document that either the Department or a licensed site remediation professional has approved; and
3. Any subsequent modification of any document referenced in (a)1 or 2 above, that either the Department or a licensed site remediation professional approves.

(b) The permittees shall:

1. Prepare and submit to the Department a biennial certification as required by this subchapter every two years following the anniversary of the date of the earliest of the following:
  - i. The date the owner of property records a deed notice as part of a remedial action;
  - ii. The date the Department establishes a ground water classification exception area pursuant to the Technical Requirements for Site Remediation rules, at N.J.A.C. 7:26E-8.3; or
  - iii. The date the Department or the licensed site professional approves a ground water remedial action report for a ground water remedial action;
2. If there is more than one remedial action permit for a site:
  - i. Submit a separate biennial certification for each remedial action permit; and
  - ii. Submit all of the biennial certifications at the same time, when the first biennial certification is due to the Department pursuant to (b)1 above, and biennially thereafter on that same date;
3. Maintain financial assurance, if applicable pursuant to N.J.A.C. 7:26C-7.7; and
4. Pay all applicable remedial action permit fees pursuant to N.J.A.C. 7:26C-4.4.

**→ 7:26C-7.5 Specific conditions applicable to soil remedial action permits**

(a) The permittees of a soil remedial action permit shall comply with:

1. The general conditions applicable to all remedial action permits at N.J.A.C. 7:26C-7.4;
2. The conditions in each deed notice recorded for the property pursuant to the Technical Requirements for Site Remediation rules at N.J.A.C. 7:26E;
3. The biennial certification requirements pursuant to N.J.A.C. 7:26E-8.5(a) through (d); and
4. All other conditions that the Department includes in the soil remedial action permit.

→ **7:26C-7.6 Specific conditions applicable to ground water remedial action permits**

(a) The permittees of a ground water remedial action permit shall comply with:

1. The general conditions applicable to all remedial action permits at N.J.A.C. 7:26C-7.4;
2. The ground water monitoring reporting requirements in any remedial action workplan or remedial action report approved by either the Department or a licensed site remediation professional;
3. The well restrictions associated with each ground water classification exception area for the site;
4. The biennial certification pursuant to N.J.A.C. 7:26E-8.6; and
5. All other conditions that the Department includes in the ground water remedial action permit.

→ **7:26C-7.7 Financial assurance for remedial action permits for remedial actions that include engineering controls**

(a) Except as provided in (b) below, the permittees for a remedial action permit for a remedial action that includes an engineering control shall:

1. Submit to the Department, on the same schedule that the permittee is required to submit the biennial certification pursuant to N.J.A.C. 7:26C-7.4(b)1, an estimate of the future costs to operate, maintain, and inspect all engineering controls part of any remedial action at the site; and
2. Maintain financial assurance in accordance with the remediation funding source options established in N.J.A.C. 7:26C-5.4, 5.5, 5.6, and 5.7:

i. In an amount equal to or greater than the most recent estimated full cost to operate, maintain, and inspect all engineering controls that are part of any remedial action over the life of the permit as most recently estimated based upon applicable guidance published by the Department or other sound basis for estimating those costs; and

ii. Until the Department terminates the permit pursuant to N.J.A.C. 7:26C-7.10.

(b) The following persons are not required comply with this section:

1. A government entity;
2. A person who is not otherwise liable for cleanup and removal costs pursuant to the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11, who purchased a contaminated site prior to May 7, 2009, and is remediating, or has remediated, the contaminated site pursuant to N.J.S.A. 58:10-23.11g,d;
3. A person who undertakes remediation at that person's primary or secondary residence;
4. The owner or operator of a child care center licensed pursuant to N.J.S.A. 30:5B-1 et seq. who performs remediation at the licensed child care center;
5. The person responsible for performing remediation at a public school or private school as defined in N.J.S.A. 18A:1-1, or a charter school established pursuant to N.J.S.A. 18A:36A-1 et seq.; and
6. The owner or operator of a small business who is responsible for performing a remediation at his or her business property.

(c) The remediation funding source surcharge payable in accordance with N.J.A.C. 7:26C-5.9 is not applicable to the financial assurance posted pursuant to this subsection.

(d) A permittee may change the amount of the financial assurance in accordance with N.J.A.C. 7:26C-5.11.

(e) A permittee may disburse monies from the funding posted in accordance with N.J.A.C. 7:26C-5.12.

(f) If any permittee fails to comply with the actions required pursuant to a remedial action permit or this subchapter, the Department, or another party as the Department may authorize, may draw on the financial assurance to achieve compliance.

→ **7:26C-7.8 Transfer of a remedial action permit**

(a) Any permittee who believes that its status as a person responsible for conducting the remediation is limited by law to that period of time that that person is a subsequent owner or operator of the property that is the subject of the remedial action permit (see N.J.A.C. 7:26C-7.2(a)2) may, prior to changing such status, request that the Department transfer the permit to a new owner, operator, or tenant. The permittee shall pay the permit transfer fee pursuant to N.J.A.C. 7:26C-4.4 and has the burden of showing that its permittee status is so limited by law.

(b) In order for a permittee to request that the Department rescind its status as a permittee pursuant to (a) above, the permittee shall, at least 60 calendar days prior to the sale or transfer of the property, transfer of the operation of the property, or termination of a lease, notify the Department and the prospective permittee, if any, in writing, of the permittee's intention to transfer the permit by providing the following information on a form appropriate for the specific remedial action permit, found on the Department's website at [www.nj.gov/dep/srp/srra/forms](http://www.nj.gov/dep/srp/srra/forms):

1. Contact information of the current permittee intending to transfer the permit;
2. Contact information of the prospective permittee, if any;
3. Site identification;
4. Confirmation that the current permittees do not have any outstanding remedial action permit fees; and
5. Confirmation that the prospective permittee requesting a transfer of the remedial action permit:
  - i. Is the new owner, operator, or tenant of or at the contaminated site;
  - ii. Has acknowledged in writing that it accepts its responsibility as a permittee; and
  - iii. Is in compliance with the financial assurance requirements of N.J.A.C. 7:26C-7.8, if applicable.

(c) The Department shall not rescind a person's status as a permittee until all of the following occur:

1. The permittee requesting transfer of the permit complies with the notice requirements in (b) above;
2. The permittee requesting transfer of the permit actually terminates its status as subsequent owner, operator, or tenant; and
3. A permittee, other than the one requesting that the Department rescind its status as a permittee, estab-

lishes financial assurance pursuant to N.J.A.C. 7:26C-7.7.

→ **7:26C-7.9 Modification of specific requirements in a remedial action permit**

(a) The Department may modify a remedial action permit as needed to protect the public health and safety and the environment.

(b) A permittee shall apply to have the Department modify a remedial action permit within 30 days after any of the following, by submitting a completed form appropriate for the specific remedial action permit, found on the Department's website at [www.nj.gov/dep/srp/srra/forms](http://www.nj.gov/dep/srp/srra/forms), which includes the following:

1. A statement that the permittee has completed a protectiveness evaluation required in its permit and has determined that the remedial action is not adequately protective of the public health and safety and of the environment, and stating the reasons for coming to this conclusion;
2. The size, duration, or contaminants of a classification exception area need to be modified;
3. Any person proposes to change the engineering controls applicable to the site, as described in the deed notice filed for the property;
4. The municipality has revised the lot and block designations of the property; or
5. The permittee changes its name or address.

(c) To request modification of any remedial action permit pursuant to (b) above, or for any other reason, the permittee shall submit to the Department an application for a remedial action permit modification to the Department as follows:

(c) To request modification of any remedial action permit pursuant to (b) above, or for any other reason, the permittee shall submit to the Department an application for a remedial action permit modification to the Department as follows:

1. The form appropriate for the specific remedial action permit, found on the Department's website at [www.nj.gov/dep/srp/srra/forms](http://www.nj.gov/dep/srp/srra/forms), which includes:

- i. Identification of the contaminated site; and
- ii. Identification and contact information of the applicant;

2. A copy of the following as applicable:

- i. The filed copy of a new deed notice;
- ii. A revised ground water classification exception area application; or
- iii. A revised remedial action workplan; and

3. The applicable permit application fee, pursuant to N.J.A.C. 7:26C-4.4.

→ **7:26C-7.10 Termination of a remedial action permit**

(a) The Department may terminate a remedial action permit upon request of a permittee if the Department finds that the remedial action:

- 1. Meets all applicable remediation standards without the need for the remedial action permit; and
- 2. Is protective of the public health and safety and of the environment without the presence of the remedial action permit.

(b) A permittee may request that the Department terminate a remedial action permit by submitting, on the form appropriate for the specific remedial action permit, found on the Department's website at [www.nj.gov/dep/srp/srra/forms](http://www.nj.gov/dep/srp/srra/forms), the following:

- 1. The name, address and telephone number of the permittee requesting termination of the permit;
- 2. The name, address and telephone number of the prospective permittee;
- 3. Site identification;
- 4. A detailed written rationale on why the permittee believes that the engineering or institutional controls, the remediation systems, or the remedial action implemented for the site no longer require oversight over time in order to be protective of the public health and safety and the environment;
- 5. If the permit is for a deed notice, a draft copy of a termination of deed notice in accordance with Appendix B to this chapter, incorporated herein by reference; and

6. Confirmation that the permittee requesting termination of the remedial action permit does not have any outstanding fees pursuant to N.J.A.C. 7:26C-4.

(c) Upon written notice that the Department has terminated a remedial action permit, the permittee may cease compliance with the remedial action permit that the Department has terminated and have the owner of the property file the termination of deed notice, if applicable.

→ **7:26C-7.11 Return of the remediation funding source**

(a) The Department shall notify in writing the person required to establish the remediation funding source, when that person is no longer required to maintain the remediation funding source.

(b) The Department shall return the remediation funding source pursuant to (c) below when:

1. The Department determines that the person responsible for conducting the remediation has completed all the substantive and financial requirements of:

- i. The oversight document;
- ii. Court order; or
- iii. Department approved remedial action workplan for an industrial establishment; or

2. The Department approves in writing one of the following for the final remedial action for the site:

- i. An innovative remedial action technology;
- ii. A limited restricted use remedial action; or
- iii. An unrestricted use remedial action.

(c) When the Department makes one of the findings or approvals listed in (b) above, the Department shall allow the person responsible for establishing the remediation funding source to terminate or modify the remediation funding source consistent with the finding or approval. The Department shall only allow that person to terminate the remediation funding source if there is no additional remediation necessary at the site.

→ **7:26C-7.12 Failure to perform the remediation**

(a) The Department shall notify in writing the person required to establish a remediation funding source if the Department determines that the person responsible for conducting the remediation has failed to perform the remediation as required pursuant to an oversight document, court order or Department approved remedial action workplan. The person shall have 30 calendar days after receipt of such notice, unless otherwise extended in writing by the Department, to perform the obligation(s) not performed.

(b) The Department shall provide a copy of the notification in (a) above to the current owners and operators of the site when the person required to establish the remediation funding source has failed to remediate the site.

(c) Thirty calendar days after the person's receipt of the notification in (a) above, the Department may, in its sole discretion, perform the remediation of a site using the funds in the remediation funding source.

(d) The Department may, in its discretion, disburse all or some of the monies to a person, other than the person who established the remediation funding source pursuant to this subchapter, after that other person has completed the remediation of the contaminated site with the Department's oversight.

END OF DOCUMENT

Westlaw

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Title 7. Department of Environmental Protection

Chapter 28. Radiation Protection Programs (Refs &amp; Annos)

☐ Subchapter 6. Standards for Protection Against Radiation

→ → 7:28-6.1 Incorporation by reference

(a) Except as set forth in (b) and (c) below, this subchapter incorporates by reference 10 CFR Part 20, Standards for Protection Against Radiation.

(b) The Department does not regulate nuclear reactors, special nuclear materials in quantities sufficient to form a critical mass, high-level waste disposal facilities, or byproduct material defined in Section 11e(2) of the Atomic Energy Act of 1954, as amended (42 U.S.C. §2014). Insofar as the incorporated rules refer to those facilities and/or materials previously referenced, those references are not incorporated, nor do any cross references include those facilities and/or materials.

(c) The following provisions of 10 CFR Part 20 are not incorporated by reference. If there is a cross reference to a Federal citation specifically entirely excluded from incorporation, then the cross referenced citation is not incorporated by virtue of the cross reference:

1. 10 CFR 20.1001, Purpose;
2. 10 CFR 20.1002, Scope;
3. 10 CFR 20.1003, Definitions, the following definitions are not incorporated by reference: "act," "Commission," "Department," and "sanitary sewerage system";
4. 10 CFR 20.1007, Communications;
5. 10 CFR 20.1009, Implementation collection requirements: OMB approval;
6. 10 CFR 20.1401, General provisions and scope;
7. 10 CFR 20.1402, Radiological criteria for unrestricted use;
8. 10 CFR 20.1403, Criteria for license termination under restricted conditions;

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9. 10 CFR 20.1404, Alternate criteria for license termination;

10. 10 CFR 20.1405, Public notification and public participation;

11. 10 CFR 20.2301, Application for exemptions;

12. 10 CFR 20.2401, Violations; and

13. 10 CFR 20.2402, Criminal penalties.

(d) The following provisions of 10 CFR Part 20 are incorporated by reference with the specified changes:

1. "Nuclear Regulatory Commission," "NRC," "Commission," and "U.S. Nuclear Regulatory Commission," as used in the provisions of Part 20 of the Code of Federal Regulations that are incorporated by reference, mean the New Jersey Department of Environmental Protection, except when specifically noted in this subchapter;

2. 10 CFR 20.1003, in the definition of "ALARA," replace "licensed activity" with "licensed or registered activity," and "and licensed materials" with ", licensed materials, and registered ionizing radiation producing machine sources";

3. 10 CFR 20.1003, in the definition of "background radiation," in the first sentence replace "or special nuclear material)" with "special nuclear material, or technologically enhanced naturally occurring radioactive material)," and replace in the last sentence "or special nuclear materials regulated by the Commission" with ", or special nuclear materials regulated by the State or the NRC, or diffuse NARM regulated by the State";

4. 10 CFR 20.1003, in the definition of "controlled area," replace "licensee" with "licensee or registrant";

5. 10 CFR 20.1003, in the definition of "declared pregnant woman," replace "licensee" with "licensee or registrant";

6. 10 CFR 20.1003, in the definition of "license," replace "parts 30 through 36, 39, 40, 50, 60, 61, 63, 70, or 72," with "N.J.A.C. 7:28-4, 51 through 60, or 63";

7. 10 CFR 20.1003, in the definition of "licensed material," replace "special nuclear material," with "special nuclear material in quantities not sufficient to form a critical mass, diffuse NARM";

8. 10 CFR 20.1003, in the definition of "occupational dose," replace "licensed and unlicensed sources of ra-

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diation, whether in the possession of the licensee or other person,” with “licensed and unlicensed, or registered or unregistered sources of radiation, whether in possession of the licensee or registrant or other person”;

9. 10 CFR 20.1003, in the definition of “public dose,” replace “under the control of a licensee,” with “under the control of a licensee or registrant.”;

10. 10 CFR 20.1003, in the definition of “survey,” replace “or other sources of radiation.” with “, other sources of radiation, or radiation from ionizing radiation-producing machines.” After the last sentence in the definition of “survey,” and “For registrants, the survey must be made under the supervision of a qualified individual.”;

11. 10 CFR 20.1003, in the definition of “unrestricted area,” replace “licensee” with “licensee or registrant”;

12. 10 CFR 20.1006, delete “Except as specifically authorized by the Commission in writing, no” with “No,” and replace “by the General Counsel” with “signed and approved by the Commissioner of the Department.”;

13. 10 CFR 20.1201, replace “licensee” with “licensee or registrant,” except in 10 CFR 20.1201(e);

14. 10 CFR 20.1207, replace entire section with “The licensee or registrant shall ensure that the annual occupational dose for minors does not exceed 10 percent of the annual dose limits specified for adult workers in 10 CFR 20.1201.”;

15. 10 CFR 20.1208, replace “licensee” with “licensee or registrant”;

16. 10 CFR 20.1301, replace “licensee” with “licensee or registrant;” and replace “sanitary sewer system” with “domestic treatment works”;

17. 10 CFR 20.1301(a)(1), replace “licensed operation” with “licensed or registered operation”;

18. 10 CFR 20.2001(a)(3), replace “within the limits of §20.1301; or” with “within the limits of §20.1301, provided prior permission in writing, in the form of a New Jersey Pollutant Discharge Elimination System permit, is obtained from the Department in accordance with N.J.A.C. 7:14A for discharges to ground or surface waters; or”;

19. 10 CFR 20.2003, replace “sanitary sewerage” with “domestic treatment works”;

20. Replace the text of 10 CFR 20.2201(a)(2) with “Reports must be made to the address and telephone

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numbers indicated in N.J.A.C. 7:28-1.5”;

21. 10 CFR 20.2201(b)(2)(ii), replace “Administrator of the appropriate NRC Regional Office listed in Appendix D to part 20” with “Supervisor, Radioactive Materials Section of the Department”;

22. Replace the text of 10 CFR 20.2202(d) with “Reports made by licensees in response to the requirements of this section must be made to the address and telephone numbers indicated in N.J.A.C. 7:28-1.5.”;

23. 10 CFR 20.2203(b)(2), replace “Privacy Act Information” with “New Jersey Open Public Records Act, N.J.S.A. 47:1A-1 et seq.”;

24. Replace the text of 10 CFR 20.2203(d) with “All licensees, who make reports under paragraph (a) of this section shall submit the report in writing either by mail or by hand delivery to the Supervisor, Radioactive Materials Section of the Department at the addresses indicated in N.J.A.C. 7:28-1.5”;

25. 10 CFR 20.2204, replace “Administrator of the appropriate NRC Regional Office listed in Appendix D to part 20” with “Supervisor, Radioactive Materials Section of the Department”;

26. 10 CFR 20.2206(c), replace the second sentence with “The licensee shall submit the report to the Supervisor, Radioactive Materials Section of the Department at the address indicated in N.J.A.C. 7:28-1.5.”; and

27. Replace the language at 10 CFR 20.2402 with “Section 26:2D-22 of the Radiation Protection Act of 1958, as amended, provides for criminal sanctions for violation of any provision of the Act.”

(e) Requests for adjudicatory hearings shall be made in accordance with N.J.A.C. 7:28-4.17, and requirements governing requests for stay of the effective date of the Department decision for which an adjudicatory hearing is requested are set forth at N.J.A.C. 7:28-4.18.

Amended by R.2005 d.156, effective may 16, 2005; R.2005 d.239, effective July 18, 2005. Adopted by R.2008 d.281, effective September 15, 2008 (operative September 30, 2009).

#### CHAPTER EXPIRATION DATE

<In accordance with N.J.S.A. 52:14B-5.1d, Chapter 28, Radiation Protection Programs, was extended by gubernatorial directive from June 21, 2010 to June 21, 2011. See: 42 N.J.R. 468(a).>

#### HISTORICAL NOTES

##### Source:

N.J.A.C. 7:28-6.1

Page 5

N.J. Admin. Code tit. 7, 7:28-6.1

2005. See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).

2005. See: 37 N.J.R. 8(a), 37 N.J.R. 2675(b).

2008. See: 40 N.J.R. 2309(a), 40 N.J.R. 5196(b).

**Public Notices:**

2009. See: 41 N.J.R. 3415(a).

**Editor's Note**

R.2008, d.281, repealed former N.J.A.C. 7:28-6.1, Exposure of individuals in controlled areas.

7:28-6.1, NJ ADC 7:28-6.1

December 19, 2011; 43 N.J. Reg. No. 24

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## New Jersey Administrative Code Currentness

## Title 7. Department of Environmental Protection

## Chapter 28. Radiation Protection Programs (Refs &amp; Annos)

## Subchapter 12. Remediation Standards for Radioactive Materials

## → 7:28-12.1 Purpose and scope

The purpose of this subchapter is to establish minimum standards for the remediation of real property contaminated by radioactive materials. This subchapter also provides direction on remediating a site contaminated with radioactive materials with regard to sampling, surveying, and laboratory requirements, remedial action selection, and remedial action requirements.

## → 7:28-12.2 Applicability

(a) The standards and/or dose criteria in this subchapter are applicable to:

1. Remediation of radioactive contamination of real property by any technologically enhanced naturally occurring radioactive materials, source, by-product, certain special nuclear material, and diffuse NARM; and
2. Any other remediation of radioactive contamination including, without limitation, any remediation pursuant to: the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq.; the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.; the Industrial Site Recovery Act, N.J.S.A. 13:1K-6 et seq.; the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq.; the Comprehensive Regulated Medical Waste Management Act, N.J.S.A. 13:1E-48.1 et seq.; the Major Hazardous Waste Facilities Siting Act, N.J.S.A. 13:1E-49 et seq.; the Sanitary Landfill Facility Closure and Contingency Fund Act, N.J.S.A. 13:1E-100 et seq.; the Regional Low Level Radioactive Waste Disposal Facility Siting Act, N.J.S.A. 13:1E-177 et seq.; any law or regulation by which the State may compel a person or licensee to perform remediation activities; or N.J.A.C. 7:26C.

(b) The standards in this subchapter are not applicable to:

1. Materials containing naturally occurring radionuclides whose concentrations have not been technologically enhanced; or
2. Coal ash that has been or is being used in:
  - i. The manufacture of construction materials including, but not limited to, cinder blocks, concrete products and roofing materials;

ii. Road construction materials including, but not limited to, asphalt filler or road base material; or

iii. Landfill cover.

(c) The Department shall apply the radiation remediation standards and dose criteria in this chapter at applicable sites as "Applicable or Relevant and Appropriate Requirements" as defined in the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq.

#### → 7:28-12.3 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise:

"Appropriate period of time" means the length of time determined by the Department, taking into consideration the radioactive half-life, total activity, concentration, and physical condition of the residual radioactivity, geologic stability of the area, and current and projected future demographics.

"Committed dose equivalent" means the total dose equivalent averaged throughout any body tissue in the 50 years after intake of a radionuclide into the body.

"Committed effective dose equivalent" means the sum of the products of the committed dose equivalents to individual tissues resulting from an intake of a radionuclide multiplied by the appropriate weighting factor ( $W_T$ ) indicated below:

Organ or Tissue	$W_T$
Gonads	0.25
Breast	0.15
Red bone marrow	0.12
Lung	0.12
Thyroid	0.03
Bone Surfaces	0.03
Remainder	0.30*
Whole Body (external)	1.00

\*0.30 results from 0.06 for each of five "remainder" organs (excluding the skin and the lens of the eye) that receive the highest doses.

"Contaminated site" means a site as defined pursuant to the Technical Requirements for Site Remediation rules at N.J.A.C. 7:26E-1.8.

"Deep-dose equivalent" means, applied to external whole-body exposure, the dose equivalent at a tissue depth of one centimeter.

"Derived concentration guideline level" means the radionuclide-specific activity concentration corresponding to the release criterion.

"Design features" means those features of a remediation that do not rely on additional expenditures after installation to achieve their intended purpose.

"Dose equivalent" means the product of the absorbed dose (D), the quality factor (Q), and other modifying factors (N). For purposes of this definition,  $N = 1$ .

"Engineering controls" means any physical mechanism to contain or stabilize contamination or ensure the effectiveness of a remedial action. Engineering controls under this subchapter may include, without limitation, caps, covers, dikes, trenches, leachate collection systems, radon remediation systems, signs, fences, physical access controls, ground water monitoring systems and ground water containment systems including, without limitation, slurry walls and ground water pumping systems.

"Final status survey" is a survey or analysis, performed after remediation, which provides data that demonstrates that all radiological parameters satisfy the remediation standards.

"Institutional controls" means a mechanism used to limit human activities at or near a contaminated site, or to ensure the effectiveness of the remedial action over time, when contaminants remain at a site in levels or concentrations above the applicable remediation standard that would allow unrestricted use of that property. Institutional controls under this subchapter may include, without limitation, structure, land and natural resource use restrictions, well restriction areas, classification exception areas, deed notices, and declarations of environmental restrictions.

"Intake dose" means the annual radiation dose to a person from all potential intake pathways (exclusive of radon inhalation), including the ingestion of water, direct ingestion of soil, intake of foods, and the inhalation of resuspended particulate matter (in committed effective dose equivalent).

"Limited restricted-use remedial action" means any remedial action that requires the continued use of institutional controls but does not require the use of an engineering control.

"Natural background radionuclide concentration" means the average value of a particular radionuclide concentration in soils measured in areas in the vicinity of the site, in an area that has not been influenced by localized human activities, including the site's prior or current operations.

"Quality factor" means the factor by which absorbed doses are multiplied to obtain a quantity that expresses the effectiveness of the absorbed dose on a common scale for all types of ionizing radiation.

"Radioactive contamination or radioactive contaminant" means the collective amount of radiation emitted from one or more radionuclides in the soil, and on/in building materials and/or equipment at concentrations above natural back-

ground levels.

“Radioactive materials” means any material, solid, liquid, or gas, that emits radiation spontaneously.

“Radionuclide” means a type of atom that spontaneously undergoes radioactive decay.

“Regional natural background variation” means the best Department estimate, based on available data, of a region's naturally experienced variation in radiation dose from mean levels that are commonly and consistently experienced by persons in the State.

“Remedial action” means those actions taken at a site, or offsite if a radioactive contaminant has migrated or is migrating there from a radioactively contaminated site as may be required by the Department, including, without limitation, removal, treatment, containment, transportation, securing, or other engineering or treatment measures, whether to an unrestricted use or otherwise, designed to ensure that any discharged radioactive contaminant at the site, or that has migrated or is migrating from the site, is remediated in compliance with the applicable remediation standards in this subchapter.

“Remediation” or “remediate” means all necessary actions to investigate and cleanup or respond to any known, suspected, or threatened discharge of radioactive contaminants, including, as necessary, the preliminary assessment, site investigation, remedial investigation, and remedial action.

“Remediation standards” means the combination of numeric standards that establish a level or concentration, and narrative standards, to which radioactive contaminants must be treated, removed or otherwise cleaned for soil, ground water or surface water, as established by the Department pursuant to N.J.S.A. 58:10B-12 and this chapter, in order to meet the health risk or environmental standards.

“Residual radioactivity” means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee's or person responsible for the remediation's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee or person responsible for the remediation, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of U.S. NRC regulations at 10 CFR Part 20 or the provisions of N.J.A.C. 7:28-12.15.

“Restricted use remedial action” means any remedial action that requires the continued use of engineering and institutional controls in order to meet the established health risk or environmental standards.

“Technologically enhanced naturally occurring radioactive materials” means any naturally occurring radioactive materials whose radionuclide concentrations or potential for human exposure have been increased by any human activities.

“Total effective dose equivalent” means the sum of the deep-dose equivalent (for external exposures) and the commit-

ted effective dose equivalent (for internal exposures).

“Uncontaminated surface soil” means soil whose average natural background radionuclide total concentrations are less than the remediation standards for radionuclides, and cannot exceed the background established for the site by more than two standard deviations.

“Unrestricted use remedial action” means any remedial action that does not require the continued use of engineering or institutional controls in order to meet the established standards.

“Vertical extent” means the average depth, measured in feet, of the post-remediation radioactive contamination over an affected area.

#### → 7:28-12.4 General requirements

(a) Any person or licensee conducting remediation pursuant to this subchapter shall comply with the requirements of N.J.A.C. 7:26E, Technical Requirements for Site Remediation, excluding those sections related to sampling, surveying, and background investigations. Sampling, surveying and laboratory requirements shall be in accordance with N.J.A.C. 7:28-12.5.

(b) The Department shall require a licensee to provide a decommissioning plan that addresses historical site assessment, scoping, characterization, remedial action options and selection, and a final status survey report when, based on the types, quantities, and half-lives of the licensed material, such elements of the decommissioning plan are appropriate.

(c) Compliance with this subchapter shall not relieve any person or licensee from complying with more stringent cleanup standards or provisions imposed by any other applicable statute, rule or regulation.

(d) Upon Departmental approval of the remedial action workplan or similar plan, the Department may not subsequently require a change to that workplan or similar plan in order to compel a different remediation standard due to the fact that the established remediation standards have changed; however, the Department may compel a different remediation standard if the difference between the new remediation standard and the remediation standard approved by the Department in the workplan or similar plan differs by an order of magnitude.

#### → 7:28-12.5 Sampling, surveying and laboratory requirements

(a) Facilities licensed under 10 CFR Part 50 that have Nuclear Regulatory Commission-approved quality assurance plans are exempt from the requirements of this section. Otherwise, in addition to the requirements in N.J.A.C. 7:26E Appendix A IV.1, persons responsible for conducting remediations or licensees shall include the following in the radionuclide analysis reports:

1. Report final results as a value plus or minus the associated error for each sample;
2. Report data as calculated, and not report "less than" values for any sample;
3. Report minimum detectable activities;
4. Calculate results for single sample and composites to the sample collection period mid point;
5. Provide a quantitation report; and
6. Provide copies of the instrument run logs.

(b) If available, persons responsible for conducting remediations or licensees shall provide:

1. The Gamma Spectroscopy Report which includes sample specific header information, peak search, peak identification, background subtraction, activity, and minimum detectable activity;
2. The Gross Beta calculation worksheets and computer generated result forms;
3. Radiochemical Iodine calculation worksheets and computer generated result forms;
4. Liquid Scintillation calculation worksheets and computer-generated result forms; and
5. Gross Alpha and Gross Beta, radium-226, uranium, and strontium-89 and 90 calculation worksheets and computer-generated result forms.

(c) Any laboratory providing radiological analysis for soil or water shall be certified pursuant to N.J.A.C. 7:18.

(d) Sampling and surveying for radioactive contamination shall be done in accordance with the protocol specified in that version of the Department of Environmental Protection's Field Sampling Procedure Manual's section on Radiological Assessment, incorporated herein by reference, in effect at the time of sampling and surveying which may be obtained by calling the Bureau of Environmental Radiation at (609) 984-5400 or from the Radiation Protection Program's web site at <http://www.state.nj.us/dep/rpp/index.htm>.

#### → 7:28-12.6 Remedial action selection

Remedial action selection for all sites contaminated with radioactive material shall be in accordance with N.J.A.C.

7:26E-5.

→ **7:28-12.7 Remedial action requirements**

The remedial action requirements for all sites contaminated with radioactive material shall be in accordance with N.J.A.C. 7:26E-6, with the exception of N.J.A.C. 7:26E-6.4, Post-remedial action requirements. Post-remedial sampling shall be conducted in accordance with the guidance provided in that version of the Department of Environmental Protection's Field Sampling Procedure Manual's section on Radiological Assessment, in effect at the time of the post-remedial sampling.

→ **7:28-12.8 Radiation dose standards applicable to remediation of radioactive contamination of all real property**

(a) Sites shall be remediated so that the incremental radiation dose to any person from any residual radioactive contamination at the site above that due to natural background radionuclide concentration, under either an unrestricted use remedial action, limited restricted use remedial action, or a restricted use remedial action, shall be as specified below:

1. For the sum of annual external gamma radiation dose (in effective dose equivalent) and intake dose (in committed effective dose equivalent), including the groundwater pathway: 15 millirem (0.15 milliSievert) total annual effective dose equivalent (15 mrem/yr TEDE).

2. For radon-222: three picocuries per liter (pCi/L) of radon gas (111 Bq/m<sup>3</sup>).

(b) Radioactively contaminated ground water shall be remediated to comply with the New Jersey Groundwater Quality Standards rules, N.J.A.C. 7:9C.

(c) Radioactively contaminated surface water shall be remediated to comply with the New Jersey Surface Water Quality Standards, N.J.A.C. 7:9B-1.14(c)6.

→ **7:28-12.9 Minimum remediation standards for TENORM and source material contamination**

(a) For radioactive contamination, the requirements of N.J.A.C. 7:28-12.8 shall be considered to be met for a specific radionuclide if:

1. Where only one radionuclide adds to the radioactive contamination of the site, the incremental concentration of the radionuclide above the natural background radionuclide concentration does not exceed the value in Table 1A, 1B (for unrestricted use), 2A, 2B (for limited restricted use), 3A, or 3B (for restricted use) below;

Table 1A Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils;  
Unrestricted Use Standards for Radioactive Contamination (pCi/g) <sup>[FN(1)]</sup>

Radionuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
U238 [FN(2)]	54	35	26	20	17	14	12	11	10
U234 [FN(2)]	62	37	26	21	17	14	12	11	10
Ra226 [FN(3)]	3	2	2	2	2	2	2	2	2
U235 [FN(2)]	29	22	17	14	12	10	9	8	7
Ac227	3	2	2	2	2	2	2	2	2
Th232	2	2	2	2	2	2	1	1	1

Table 1B Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils; Unrestricted Use Standards for Radioactive Contamination (Bq/g) [FN(1)]

Radionuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
U238 [FN(2)]	2.02	1.29	0.94	0.75	0.62	0.53	0.46	0.41	0.36
U234 [FN(2)]	2.29	1.36	0.98	0.76	0.62	0.53	0.46	0.41	0.36
Ra226 [FN(3)]	0.10	0.08	0.08	0.08	0.07	0.07	0.07	0.06	0.06
U235 [FN(2)]	1.07	0.08	0.63	0.52	0.44	0.38	0.34	0.30	0.27
Ac227	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07
Th232	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05

Table 2A Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils; Limited Restricted Use Standards for Radioactive Contamination (pCi/g) [FN(1)]

Radionuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
U238 [FN(2)]	64	41	30	24	20	17	15	13	12
U234 [FN(2)]	69	42	30	24	19	16	14	13	11
Ra226 [FN(3)]	5	4	3	3	2	2	2	2	2
U235 [FN(2)]	37	27	22	18	15	13	11	10	9
Ac227	5	5	5	5	5	5	5	4	4
Th232	3	3	3	3	3	3	3	3	3

Table 2B Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils; Limited Restricted Use Standards for Radioactive Contamination (Bq/g) [FN(1)]

Radionuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
U238 [FN(2)]	2.37	1.52	1.12	0.88	0.73	0.62	0.54	0.48	0.43
U234 [FN(2)]	2.56	1.56	1.12	0.88	0.72	0.61	0.53	0.47	0.42
Ra226 [FN(3)]	0.19	0.13	0.11	0.10	0.09	0.09	0.08	0.08	0.08
U235 [FN(2)]	1.38	1.01	0.80	0.65	0.55	0.48	0.42	0.38	0.34
Ac227	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Th232	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10	0.10

Table 3A Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils;  
Restricted Use Standards for Radioactive Contamination (pCi/g) [FN(1)]

Feet of Uncontaminated Surface Soil (USS)	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	U238 [FN(2)]	USS 1	82	46	32	24	20	17	15	13
2		USS 2	83	46	32	25	20	17	15	13
3		USS 3	83	46	33	25	20	17	15	13
4		USS 4	83	47	33	25	20	17	15	13
5		USS 5	85	47	33	25	21	18	15	13
6	U234 [FN(2)]	USS 1	81	45	31	24	19	16	14	13
7		USS 2	81	45	31	24	20	17	14	13
8		USS 3	81	45	32	24	20	17	14	13
9		USS 4	81	46	32	24	20	17	15	13
10		USS 5	83	46	32	25	20	17	15	13
11	Ra226 [FN(3)]	USS 1	7	4	3	3	2	2	2	2
12		USS 2	7	4	3	3	2	2	2	2

13		USS 3	7	4	3	3	2	2	2	2
14		USS 4	7	4	3	3	2	2	2	2
15		USS 5	7	4	3	3	2	2	2	2
16	U235 [FN(2)]	USS 1	62	35	25	19	16	13	11	10
17		USS 2	67	37	25	20	16	13	12	10
18		USS 3	67	37	26	20	16	14	12	11
19		USS 4	67	37	26	20	16	14	12	11
20		USS 5	68	37	26	20	17	14	13	11
21	Ac227	USS 1	17	9	6	5	5	5	5	4
22		USS 2	17	10	7	7	6	5	5	5
23		USS 3	17	10	10	8	6	6	6	6
24		USS 4	17	15	10	8	8	8	8	8
25		USS 5	17	15	10	10	10	10	10	10
26	Th232	USS 1	13	9	7	5	4	2	3	3
27		USS 2	13	10	7	5	4	3	3	3
28		USS 3	13	10	7	5	4	4	4	4
29		USS 4	13	10	7	5	5	5	5	5
30		USS 5	13	10	7	6	6	6	6	6
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Table 3B Allowed Incremental Derived Concentration Guidance Level of Individual Radionuclides in Soils; Restricted Use Standards for Radioactive Contamination (Bq/g)(<sup>1</sup>)

Feet of Uncontaminated Surface Soil (USS)	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	U238 [FN(2)]	USS 1	3.03	1.70	1.18	0.90	0.74	0.63	0.54	0.48
2		USS 2	3.08	1.71	1.18	0.92	0.75	0.63	0.55	0.48

3		USS 3	3.09	1.71	1.21	0.92	0.75	0.63	0.55	0.49
4		USS 4	3.09	1.74	1.21	0.92	0.75	0.64	0.56	0.49
5		USS 5	3.14	1.74	1.21	0.93	0.77	0.65	0.56	0.50
6	U234 [FN(2)]	USS 1	2.98	1.66	1.15	0.88	0.72	0.61	0.53	0.47
7		USS 2	2.98	1.66	1.15	0.89	0.73	0.61	0.53	0.47
8		USS 3	2.98	1.66	1.17	0.90	0.73	0.62	0.54	0.47
9		USS 4	2.98	1.70	1.18	0.90	0.74	0.62	0.54	0.47
10		USS 5	3.05	1.70	1.18	0.91	0.74	0.63	0.54	0.48
11	Ra226 [FN(3)]	USS 1	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
12		USS 2	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
13		USS 3	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
14		USS 4	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
15		USS 5	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
16	U235 [FN(2)]	USS 1	2.30	1.30	0.91	0.70	0.59	0.49	0.42	0.38
17		USS 2	2.47	1.36	0.94	0.73	0.59	0.49	0.43	0.39
18		USS 3	2.48	1.36	0.95	0.73	0.59	0.50	0.44	0.40
19		USS 4	2.49	1.38	0.95	0.73	0.60	0.52	0.45	0.41
20		USS 5	2.51	1.38	0.95	0.74	0.62	0.53	0.47	0.42
21	Ac227	USS 1	0.62	0.34	0.24	0.18	0.18	0.18	0.17	0.17
22		USS 2	0.63	0.36	0.24	0.24	0.23	0.20	0.19	0.19
23		USS 3	0.63	0.36	0.36	0.29	0.23	0.23	0.23	0.23
24		USS 4	0.63	0.54	0.37	0.29	0.28	0.28	0.28	0.28
25		USS 5	0.63	0.54	0.37	0.36	0.36	0.36	0.36	0.36
26	Th232	USS 1	0.48	0.35	0.25	0.19	0.15	0.13	0.11	0.10
27		USS2	0.48	0.39	0.26	0.19	0.15	0.13	0.12	0.12
28		USS3	0.48	0.39	0.26	0.19	0.15	0.14	0.14	0.14
29		USS4	0.48	0.39	0.26	0.19	0.17	0.17	0.17	0.17
30		USS 5	0.48	0.39	0.26	0.22	0.22	0.22	0.22	0.22
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18	0.36
19	0.37
20	0.37
21	0.17
22	0.19
23	0.23
24	0.28
25	0.36
26	0.10
27	0.12
28	0.14
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[FN(1)] The allowed Incremental Concentrations are added to the natural background radionuclide concentration to obtain the absolute value of the allowed radionuclide concentration following site remediation.

[FN(2)] These allowable concentrations may however, further be limited by the chemical toxicity of uranium.

Applicants should inquire with NJDEP's Site Remediation Program for the additional applicable chemical cleanup standards for uranium.

[FN(3)] When more than one nuclide is present, use the Radium-226 Table in Appendix A, incorporated herein by reference, for applying the sum of the fractions rule. Then use whatever number is more restrictive for radium-226, the value in Tables 1A through 3B or the value derived by using the sum of the fractions rule.

2. Where more than one radionuclide contaminant is present at the site, their concentrations meet the sum of the fractions as described below:

$$\text{Sum of } \frac{CA_i}{C_i} < 1$$

where:

$CA_i$  = the incremental concentration of radionuclide i at the site, and

$C_i$  = the incremental allowed concentration of radionuclide i from Table 1A, 1B, 2A, 2B, 3A, or 3B above, if it were the only remaining radionuclide at the site; and

3. Natural background radionuclide concentration shall be established by the methods presented in the Multi Agency Radiation Survey and Site Investigation Manual (MARSSIM), NUREG-1575, EPA 402 R-97-018, and any subsequent revisions thereto, or as discussed in Chapter 12 of the Department's Field Sampling Procedures Manual.

- (b) As an alternate, the requirements of N.J.A.C. 7:28-12.8 shall be considered to be met for a specific radionuclide if:

1. Where only one radionuclide adds to the radioactive contamination of the site, the incremental concentration of the radionuclide above the natural background radionuclide concentration and the amount of uncontaminated surface soil meet the pre-mixing values in Table 4A, 4B (for unrestricted use), 5A, or 5B (for limited restricted use) below;

Table 4A Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils; Required Depth of USS; Pre-Mixing Values--Unrestricted Use (pCi/g) [FN(1)]

Feet of Uncontaminated Surface Soil (USS)	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	U238 [FN(2)]	USS 1	70*	39	27	21	17	14	12	11
2		USS 2	76	40	28	21	17	14	13	11
3		USS 3	76	41	28	22	17	15	13	11
4		USS 4	77	42	28	22	18	15	13	11
5		USS 5	78	42	28	22	18	15	13	12
6	U234 [FN(2)]	USS 1	74	40	27	21	17	14	12	11
7		USS 2	74	40	27	21	17	14	13	11
8		USS 3	74	40	28	21	17	15	13	11
9		USS 4	76	42	28	22	18	15	13	11
10		USS 5	78	42	28	22	18	15	13	11
11	Ra226 [FN(3)]	USS 1	5*	3*	3	3	3	2	2	2
12		USS 2	7	4	3	3	2	2	2	2
13		USS 3	7	4	3	3	2	2	2	2
14		USS 4	7	4	3	3	2	2	2	2
15		USS 5	7	4	3	3	2	2	2	2
16	U235 [FN(2)]	USS 1	43*	26*	19*	15	13	11	9	8
17		USS 2	51*	29*	21	15*	13	11	9	8
18		USS 3	58*	31*	21	16	13	11	10	9
19		USS 4	62*	31*	21	16	13	11	10	9
20		USS 5	62*	32*	21	16	14	12	10	9
21	Ac227	USS 1	5*	3*	3	2	2	2	2	2
22		USS 2	6*	4	3	3	3	3	3*	3*
23		USS 3	8	5	4	3	4	3	3*	3*
24		USS 4	11*	6*	5*	4*	3*	3*	3*	3*
25		USS 5	13*	8*	5*	5*	4*	4*	4*	3*
26	Th232	USS 1	4*	3*	2*	2	2	2	1	1
27		USS 2	6*	4*	3	3	2	2	2	2
28		USS 3	8*	5	4	2*	2	2	2	2
29		USS 4	10*	6	3*	2*	2	2	2	2
30		USS 5	11	5*	3*	3	3	2*	2*	2*
31										

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1	10
2	10
3	10
4	10
5	10
6	10
7	10
8	10
9	10
10	10
11	2
12	2
13	2
14	2
15	2
16	7
17	8
18	8
19	8
20	8
21	2
22	3*
23	3*
24	3*
25	3*
26	1
27	2
28	2
29	2
30	2*
31	

Table 4B Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils;

Required Depth of USS; Pre-Mixing Values--Unrestricted Use (Bq/g) [FN(1)]

Feet of Uncontaminated Surface Soil (USS)	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	U238 [FN(2)]	USS 1	2.60*	1.46	1.00	0.77	0.64	0.53	0.46	0.41
2		USS 2	2.80	1.49	1.03	0.79	0.64	0.54	0.46	0.41
3		USS 3	2.81	1.51	1.05	0.80	0.64	0.54	0.47	0.42
4		USS 4	2.86	1.54	1.05	0.80	0.65	0.55	0.48	0.42
5		USS 5	2.88	1.54	1.05	0.81	0.66	0.56	0.49	0.43
6	U234 [FN(2)]	USS 1	2.75	1.46	1.00	0.76	0.62	0.53	0.46	0.41
7		USS 2	2.75	1.47	1.01	0.78	0.64	0.53	0.46	0.41
8		USS 3	2.75	1.48	1.04	0.80	0.64	0.54	0.47	0.41
9		USS 4	2.80	1.54	1.05	0.80	0.65	0.55	0.47	0.41
10		USS 5	2.88	1.54	1.05	0.81	0.65	0.55	0.47	0.42
11	Ra226 [FN(3)]	USS 1	0.18*	0.11*	0.11	0.10	0.09	0.08	0.07	0.06
12		USS 2	0.28	0.13	0.11	0.10	0.09	0.08	0.07	0.07
13		USS 3	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
14		USS 4	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
15		USS 5	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
16	U235 [FN(2)]	USS 1	1.59*	0.96*	0.70*	0.57	0.47	0.39	0.34	0.30
17		USS 2	1.89*	1.07*	0.78	0.55*	0.47	0.39	0.34	0.31
18		USS 3	2.15*	1.15*	0.78	0.59	0.47	0.40	0.35	0.32
19		USS 4	2.30*	1.15*	0.79	0.59	0.48	0.41	0.37	0.33
20		USS 5	2.30*	1.17	0.79	0.59	0.50	0.43	0.38	0.34

21	Ac227	USS 1	0.18*	0.10*	0.10	0.08	0.08	0.08	0.08	0.07
22		USS 2	0.21*	0.14	0.11	0.11	0.11*	0.10	0.09	0.09
23		USS 3	0.28	0.18	0.14*	0.11*	0.13	0.13	0.09*	0.09*
24		USS 4	0.41*	0.22*	0.18*	0.14*	0.11*	0.11*	0.11*	0.09*
25		USS 5	0.48*	0.30*	0.18*	0.18*	0.14*	0.14*	0.14*	0.11*
26	Th232	USS 1	0.15*	0.11*	0.09*	0.09	0.07	0.06	0.06	0.05
27		USS 2	0.22*	0.15*	0.13	0.10	0.08	0.07	0.06	0.06
28		USS 3	0.30*	0.20	0.14	0.08*	0.08	0.07	0.07	0.07
29		USS 4	0.37*	0.21	0.11*	0.08*	0.09	0.09	0.09	0.09
30		USS 5	0.42	0.20*	0.11*	0.11	0.11	0.09*	0.09*	0.09*
31										

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\*\*\*\*\* This is piece: 2

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1	0.36
2	0.37
3	0.37
4	0.38
5	0.38
6	0.36
7	0.37
8	0.37
9	0.37
10	0.37
11	0.06
12	0.07
13	0.08
14	0.08
15	0.08
16	0.27
17	0.28
18	0.29
19	0.30
20	0.31
21	0.07

22	0.09
23	0.09*
24	0.09*
25	0.11*
26	0.05
27	0.06
28	0.07
29	0.09
30	0.09*
31	

Table 5A Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils;  
Required Depth of USS; Pre-Mixing Values--Limited Restricted Use (pCi/g) [FN(1)]

Feet of Uncontam-  
inated

Feet of Vertical Extent of Residual Radionuclides (VE)

Surface Soil (USS)	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
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[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	U238 [FN(2)]	USS 1	82	45	32	24	20	17	15	13
2		USS 2	83	46	32	25	20	17	15	13
3		USS 3	83	46	33	25	20	17	15	13
4		USS 4	83	47	33	25	20	17	15	13
5		USS 5	85	47	33	25	21	18	15	13
6	U234 [FN(2)]	USS 1	81	45	31	24	19	16	14	13
7		USS 2	81	45	31	24	20	17	14	13
8		USS 3	81	45	32	24	20	17	14	13
9		USS 4	81	46	32	24	20	17	15	13
10		USS 5	83	46	32	25	20	17	15	13

11	Ra226 [FN(3)]	USS 1	7	4	3	3	2	2	2	2
12		USS 2	7	4	3	3	2	2	2	2
13		USS 3	7	4	3	3	2	2	2	2
14		USS 4	7	4	3	3	2	2	2	2
15		USS 5	7	4	3	3	2	2	2	2
16	U235 [FN(2)]	USS 1	62	32*	24*	19	16	13	11	10
17		USS 2	67	37	25	20	16	13	12	10
18		USS 3	67	37	26	20	16	14	12	11
19		USS 4	67	37	26	20	16	14	12	11
20		USS 5	68	37	26	20	17	14	13	11
21	Ac227	USS 1	9*	7*	6	5	5	5	5	4
22		USS 2	14*	10	7	7	6	5	5	5
23		USS 3	18	10	10	8	6	6	6	6
24		USS 4	18	15	10	8	8	7*	7*	7*
25		USS 5	26	15	10	10	9*	8*	8*	7*
26	Th232	USS 1	7*	5*	5*	4*	4	3	3	3
27		USS 2	10*	7*	6*	5	4	3	3	3
28		USS 3	14*	8*	7	5	4	4	4	4
29		USS 4	17*	10	7	5	5	5	5	5
30		USS 5	20*	10	7	6	6	6	6	5*
31										

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\*\*\*\*\* This is piece: 2

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1	12
2	12
3	12
4	12
5	12
6	11
7	11
8	11
9	11

10	11
11	2
12	2
13	2
14	2
15	2
16	9
17	9
18	10
19	10
20	10
21	4
22	5
23	6
24	7*
25	7*
26	3
27	3
28	4
29	5
30	5*
31	

Table 5B Allowed Incremental Derived Concentration Guideline Level of Individual Radionuclides in Soils;  
Required Depth of USS; Pre-Mixing Values--Limited Restricted Use (Bq/g) <sup>[FN(1)]</sup>

Feet of Uncontam- inated	Feet of Vertical Extent of Residual Radionuclides (VE)								
Surface Soil (USS)	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	U238 [FN(2)]	USS 1	3.03	1.67	1.18	0.90	0.74	0.63	0.54	0.48
2		USS 2	3.08	1.71	1.18	0.92	0.75	0.63	0.55	0.48
3		USS 3	3.09	1.71	1.21	0.92	0.75	0.63	0.55	0.49
4		USS 4	3.09	1.74	1.21	0.92	0.75	0.64	0.56	0.49
5		USS 5	3.14	1.74	1.21	0.93	0.77	0.65	0.56	0.50
6	U234 [FN(2)]	USS 1	2.98	1.66	1.15	0.88	0.72	0.61	0.53	0.47
7		USS 2	2.98	1.66	1.15	0.89	0.73	0.61	0.53	0.47
8		USS 3	2.98	1.66	1.17	0.90	0.73	0.62	0.54	0.47
9		USS 4	2.98	1.70	1.18	0.90	0.74	0.62	0.54	0.47
10		USS 5	3.05	1.70	1.18	0.91	0.74	0.63	0.54	0.48
11	Ra226 [FN(3)]	USS 1	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
12		USS 2	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
13		USS 3	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
14		USS 4	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
15		USS 5	0.28	0.13	0.11	0.10	0.09	0.09	0.08	0.08
16	U235 [FN(2)]	USS 1	2.30	1.18*	0.89*	0.70	0.59	0.49	0.42	0.38
17		USS 2	2.47	1.36	0.94	0.73	0.59	0.49	0.43	0.39
18		USS 3	2.48	1.36	0.95	0.73	0.59	0.50	0.44	0.40
19		USS 4	2.49	1.38	0.95	0.73	0.60	0.52	0.45	0.41
20		USS 5	2.51	1.38	0.95	0.74	0.62	0.53	0.47	0.42
21	Ac227	USS 1	0.33	0.26*	0.24	0.18	0.18	0.18	0.17	0.17
22		USS 2	0.52*	0.36	0.24	0.24	0.23	0.20	0.19	0.19
23		USS 3	0.66	0.36	0.36	0.29	0.23	0.23	0.23	0.23
24		USS 4	0.66	0.54	0.37	0.29	0.28	0.26*	0.26*	0.26*
25		USS 5	0.97	0.54	0.37	0.36	0.33*	0.28*	0.28*	0.26*
26	Th232	USS 1	0.26*	0.18*	0.18*	0.15*	0.15	0.13	0.11	0.10
27		USS 2	0.37*	0.26*	0.22*	0.19	0.15	0.13	0.12	0.12
28		USS 3	0.52*	0.30*	0.26	0.19	0.15	0.14	0.14	0.14
29		USS 4	0.63*	0.39	0.26	0.19	0.17	0.17	0.17	0.17
30		USS 5	0.74*	0.39	0.26	0.22	0.22	0.22	0.22	0.17
31										

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1	0.43
2	0.43
3	0.44
4	0.44
5	0.44
6	0.42
7	0.42
8	0.42
9	0.42
10	0.43
11	0.08
12	0.08
13	0.08
14	0.08
15	0.08
16	0.34
17	0.35
18	0.36
19	0.37
20	0.37
21	0.17
22	0.19
23	0.23
24	0.26*
25	0.26*
26	0.10
27	0.12
28	0.14
29	0.17
30	0.17
31	

\* Values were back-calculated to ensure 15 mrem/yr TEDE after mixing.

[FN(1)] The allowed Incremental Concentrations are added to the natural background radionuclide concentration to obtain the absolute value of the allowed radionuclide concentration before mixing.

[FN(2)] These allowable concentrations may however, further be limited by the chemical toxicity of uranium. Applicants should inquire with NJDEP's Site Remediation Program for the additional applicable chemical cleanup standards for uranium.

[FN(3)] When more than one nuclide is present, use the Radium-226 Table in Appendix B, incorporated herein by reference, for applying the sum of the fractions rule. Then use whatever number is more restrictive for radium-226, the value in Tables 4A through 5B or the value derived using the sum of the fractions rule.

2. After it is established that the concentrations in Table 4A, 4B, 5A, or 5B above are met, the layer of residual radionuclides shall be mixed thoroughly with the layer of uncontaminated surface soil to achieve a uniform concentration, as outlined in Chapter 12 of the Department's Field Sampling Procedures Manual, throughout the soil column;

3. Where more than one radionuclide contaminant is present at the site, their concentrations meet the sum of the fractions as described below:

$$\text{Sum of } \frac{CA_i}{C_i} \leq 1$$

where:

$CA_i$  = the incremental concentration of radionuclide i at the site, and

$C_i$  = the incremental allowed concentration of radionuclide i from Table 4A, 4B, 5A, or 5B above, if it were the only remaining radionuclide at the site; and

4. The requirements in (a)3 above shall be met.

**→ 7:28-12.10 Minimum remediation standards for accelerator-produced, by-product, and certain special nuclear materials**

(a) Remediation standards shall meet the requirements at N.J.A.C. 7:28-12.8.

(b) Computer models acceptable to the Department shall be used to determine the remediation standards.

(c) Modeling parameters used in developing unrestricted and restricted use standards shall be equivalent to those used in the NJDEP's model, RaSoRS, as supplemented or amended, and incorporated herein by reference, which is available on the Radiation Protection Program's website at <http://www.state.nj.us/dep/rpp/index.htm>.

(d) Dose calculations shall be performed out to the time of peak dose or 1,000 years, whichever is longer.

(e) Restricted use remediation standards shall meet requirements at N.J.A.C. 7:28-12.11(e) and 12.12.

→ 7:28-12.11 Petition for alternative remediation standards for radioactive contamination

(a) In lieu of using the minimum remediation standards for radioactive contamination found at N.J.A.C. 7:28-12.9 or developed under N.J.A.C. 7:28-12.10, a person or licensee may petition the Department for an alternative remediation standard for radioactive contamination. Such an alternate remediation standard:

1. Shall not result in incremental doses, for sum of annual external radiation dose and intake dose, exceeding 15 mrem/yr (0.15 mSv/yr) total effective dose equivalent;
2. Shall not result in incremental concentrations exceeding three pCi/L (111 Bq/m<sup>3</sup>) of radon in indoor air in the lowest level of the building;
3. Shall not result in radionuclide in groundwater levels exceeding those in the New Jersey Groundwater Quality Standards in N.J.A.C. 7:9C; and
4. Shall not result in radionuclide in surface water levels exceeding those in the New Jersey Surface Quality Standards in N.J.A.C. 7:9B-1.14(c)6.

(b) The Department shall not consider a petition for an alternative remediation standard for radionuclides that is supported by increasing, in any manner, the allowed incremental dose criterion of 15 mrem/yr (0.15 mSv/yr) or the allowed incremental radon in air concentration of three pCi/L (111 Bq/m<sup>3</sup>), or varying the parameters listed in Tables 6 or 7 below.

Table 6

<u>Parameter</u>	<u>Unrestricted</u>	<u>Limited or Restricted</u>
Indoor onsite breathing rate (m <sup>3</sup> /hr)	0.63	1.4
Outdoor onsite breathing rate (m <sup>3</sup> /hr)	1.40	1.4
Soil ingestion rate (g/yr)	70	12.5
Homegrown crop ingestion rate (g/yr)	17,136	0
Drinking water consumption rate (l/yr)	700	700
Shielding factor through basement or slab	0.20	0.20
Shielding factor through wall	0.80	0.80
Shielding factor outside	1.00	1.00

Table 7 Soil to Vegetation Transfer Factors

<u>Element</u>	<u>pCi/g plant (wet) to pCi/g soil (dry)</u>
Th	1E-3
Ra	4E-2

Pb	1E-2
Po	1E-3
U	2.5E-3
Ac	2.5E-3
Pa	1E-2
Bi	1E-1

(c) The Department shall consider petitions only in cases where site-specific or waste specific factors, and/or site design features are used in performing the dose assessment, which are different than those used by the Department in establishing the remediation standards in N.J.A.C. 7:28-12.9 or 12.10. Factors which the Department shall consider in a petition for an alternate remediation standard include, but are not limited to:

1. The chemical or physical state of the radioactive material;
2. Site-specific soil characteristics, depth to groundwater and other geological and hydrogeological characteristics which may substantially change the potential dose from radionuclides, as compared to the values listed in Tables 8 and 9 below.

Table 8 Generic Site Input Parameters for Groundwater Pathway Analysis

Dimensions of contaminated zone, LxW (m)	100 x 100
Percolation rate (vertical Darcy velocity, m/yr)	0.5
Volumetric water content in contaminated zone ( $\text{m}^3/\text{m}^3$ )	0.35
Volumetric water content in unsaturated zone ( $\text{m}^3/\text{m}^3$ )	0.2
Bulk density of contaminated zone ( $\text{g}/\text{m}^3$ )	1.6
Bulk density of saturated zone ( $\text{g}/\text{m}^3$ )	1.6
Unsaturated zone thickness (distance from bottom of source to aquifer, m)	0.5
Porosity of aquifer	0.45
Longitudinal dispersivity in aquifer (m)	9
Transverse dispersivity in aquifer (m)	4
Pore velocity in aquifer (m/yr)	4
Well screen thickness (mixing depth, m)	10

Table 9 Sorption Coefficients used for Groundwater Pathway Analysis

<u>Isotopes</u>	<u>Kd (mg/L)</u>
uranium	35
thorium	3,200
radium	500
lead	270

proactinium

550

actinium

450

3. Use of caps, covers, sealants, geotextile membranes, limits on the vertical extent of radioactive contamination remaining on site and/or other engineering or institutional controls that reduce potential exposures to radioactive materials; and

4. Changes in indoor and outdoor occupancy times, which are justified by land uses other than residential or commercial.

(d) A petition for an alternate remediation standard shall include an analysis demonstrating how and why the difference in factors such as those in Tables 8 and 9 above and/or indoor and outdoor occupancy times will result in substantially different remediation standards than those in N.J.A.C. 7:28-12.9.

(e) Regardless of the factors used by the petitioner or licensee, the Department shall not approve alternative standard petitions that include institutional and engineering controls where failure of those controls, not including the failure of a radon remediation system, would result in more than 100 mrem (one mSv) total annual effective dose equivalent.

(f) In the event the Department determines that sufficient evidence exists to support consideration of an alternative remediation standard, the petitioner or licensee shall submit a written analysis which demonstrates compliance with the dose limits in N.J.A.C. 7:28-12.9 or 12.10 including:

1. The remedial action informational requirements of N.J.A.C. 7:26E-6; and

2. A dose assessment analysis, including:

i. An estimate of the radiation doses received by a post-remediation on-site resident for an unrestricted use remedial action, or by an employee (of a proposed commercial use facility) for a limited restricted use or restricted use remedial action;

ii. A presentation of all equations or other mathematical techniques used, either directly or embodied in a computer model, to predict the movement of radionuclides and/or their resulting radiation dose;

iii. Dose calculations which shall be extended for a period of 1,000 years or to the time of peak dose, whichever is longer;

iv. A presentation of all numerical input parameters to equations or computer models, the range of values for those parameters, including reference sources, the value selected for use and the basis for that selection;

v. A presentation of other relevant factors and assumptions used in the analyses, such as site-specific geology,

land use, etc.;

vi. An analysis of which input parameters, when varied, would most significantly affect radiation dose results, commonly referred to as a sensitivity analysis; and

vii. An analysis of both continued use of existing structures and future use scenarios. Future use scenarios shall include, if applicable, the construction of buildings for either unrestricted use remedial actions or limited restricted use remedial actions, including excavations for basements and/or footings.

(g) Engineering controls or institutional controls may be incorporated as part of a petition for an alternative remediation standard provided that these controls will be durable and implemented for an appropriate period of time to achieve their intended purpose.

(h) Computer models acceptable to the Department may be used by the petitioner or licensee for an alternative remediation standard to confirm that the requirements of N.J.A.C. 7:28-12.9 or 12.10 have been and will continue to be met.

→ **7:28-12.12 Requirements pertaining to engineering or institutional controls**

(a) All remediation proposals shall designate the intended use(s) of the property. Such intended use(s) shall be restricted as necessary to prevent future exposure, and shall otherwise be consistent with current and projected State and local zoning designations or land uses. For sites not remediated to the unrestricted use standards in N.J.A.C. 7:28-12.9 or 12.10, the Department shall define the nature and duration of all appropriate engineering or institutional controls necessary to meet the standards in N.J.A.C. 7:28-12.9, 12.10, or 12.11(a), based upon the particular conditions of the site.

(b) In order for any remediation under this subchapter requiring engineering controls or institutional controls to meet the standards in N.J.A.C. 7:28-12.9, 12.10, or 12.11(a), the person responsible for conducting the remediation, or licensee, shall, in addition to meeting the provisions of N.J.S.A. 58:10B-13:

1. Implement all necessary actions, as determined by the Department, to assure that such engineering or institutional controls are being implemented and maintained for an appropriate period of time; and

2. Provide sufficient financial assurance for the costs of implementing and maintaining the requisite active engineered or institutional controls for an appropriate period of time. Acceptable financial assurance mechanisms are set forth at 10 CFR 20.1403(c), incorporated herein by reference.

(c) A person responsible for conducting the remediation, or the licensee, shall conduct public outreach if the Department determines that outreach is needed, or when the Department determines that there is substantial public interest in activities concerning restricted release license termination.

1. The Department may determine that there is substantial public interest when it receives:

- i. A petition containing the signatures of 25 or more people that live or work within 200 feet of the site, if contamination has not migrated from the site boundary;
- ii. A petition containing the signatures of 25 or more people that live or work within 200 feet of the extent of contamination, if contamination has migrated from the site boundary; or
- iii. A written request by a municipal official, such as a mayor or chairperson of an environmental commission, or a designated local health official.

2. When the Department determines that there is substantial public interest, the Department shall notify the person responsible for conducting the remediation or the licensee and post a summary of findings on the Department's web site at [www.state.nj.us/dep](http://www.state.nj.us/dep); and

3. The person responsible for conducting the remediation or the licensee shall develop and implement enhanced public notice based on the expressed needs of the community and may include the following:

- i. Publicizing and hosting an information session or public meeting;
- ii. Publishing a notice containing basic information about the site in the local paper of record; or
- iii. Establishing a local information repository.

4. The notifications required pursuant to this section are not intended to satisfy the public participation requirements applicable to sites subject to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. and the National Contingency Plan, 40 CFR Part 300.

→ **7:28-12.13 Requirements pertaining to a change in land use**

(a) Any subsequent proposed use of a property that is different from the intended use (other than unrestricted use remedial actions) described in the original remediation proposal shall require a prior review and prior approval by the Department. To initiate this review, 90 calendar days prior to a proposed change in land use, the person or licensee proposing such use shall prepare and submit to the Department, at the Bureau of Environmental Radiation, PO Box 415, Trenton, NJ 08625-0415, and to each affected municipality, a brief written description of the new proposed use as compared to the intended use upon which the original remediation was based including all planned soil excavations, and any additional remedial actions to be implemented.

(b) If the Department determines that the proposed new use may cause the dose limitations of N.J.A.C. 7:28-12.8 to be

exceeded, the person or licensee requesting the use change shall be required to prepare and submit to the Department's Bureau of Environmental Radiation, PO Box 415, Trenton, NJ 08625-0415, a dose assessment analysis, containing the information required under N.J.A.C. 7:28-12.11(f)2, (g), and (h), to ascertain whether the dose limitation requirements of N.J.A.C. 7:28-12.8 will be met for the proposed new use.

(c) In preparing the dose assessment analysis, the person or licensee may incorporate into the new use plan new remedial measures such as different radionuclide in soil concentrations, or radioactive contamination vertical extents, and/or new engineering or institutional controls, provided that for engineering or institutional controls, the person responsible for conducting the remediation or licensee provides for the cost of implementing and maintaining them as specified in N.J.A.C. 7:28-12.12(c)3.

#### → 7:28-12.14 Requirements pertaining to the final status survey

The final status survey is performed to demonstrate that a site meets the remediation standards. It shall be done in accordance with that version of the Department of Environmental Protection's Field Sampling Manual's section on Radiological Assessment, which is incorporated herein by reference, in effect at the time of the survey which may be obtained by calling the Bureau of Environmental Radiation at (609) 984-5400 or from the Radiation Protection Program's web site at <http://www.state.nj.us/dep/rpp/index.htm>. Chapter 12 of the Department's Field Sampling Procedures Manual follows the methodology provided in MARSSIM with some modifications.

#### → 7:28-12.15 Requirements pertaining to onsite burial or capping

(a) No owner or licensee shall bury or construct an engineered barrier (cap) over radioactive material onsite unless the requirements of N.J.A.C. 7:28-12.8 and 12.11 are met.

(b) Owners or licensees with sites that have been used for burial of radioactive materials or where radioactive material has been capped, shall not be allowed to convert these sites to other uses unless the requirements of N.J.A.C. 7:28-12.8 and 12.11 are met.

(c) The owner or licensee of any burial ground or capped material shall notify the Department in writing not less than 30 days in advance of any transfer of title to the property involved.

#### Appendix A

Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways <sup>[FN(1)]</sup>

Nuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226									

## Unrestricted Use

Standards	3	2	2	2	2	2	2	2	2
-----------	---	---	---	---	---	---	---	---	---

## Ra226

## Limited Restricted

Use Standards	5	5	5	5	5	5	5	4	4
---------------	---	---	---	---	---	---	---	---	---

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways [FN(1)]
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2	
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1	
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2	
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[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	Feet of Uncontaminated	Feet of Vertical Extent of Residual Radionuclides (VE)							
2	Surface Soil (USS)	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8
3	Ra22								
4	Restricted								

	Use									
5	Standards	USS 1	18	15	10	8	6	5	5	4
6		USS 2	18	15	10	8	6	5	5	5
7		USS 3	18	15	10	8	6	6	6	6
8		USS 4	18	15	10	8	7	7	7	7
9		USS 5	18	15	10	9	9	9	9	9

\*\*\*\*\*

\*\*\*\*\* This is piece: 2

\*\*\*\*\*

1	
2	VE9
3	
4	
5	4
6	5
7	6
8	7
9	9

Allowed Incremental Derived Concentration Guideline Levels (Bq/g) for the Gamma and Intake Pathways [FN(1)]

Nuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226									
Unrestricted Use									
Standards	0.13	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08
Ra226									
Limited Restricted Use									
Standards	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.15

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	Allowed Incremental Derived Concentration Guideline Levels (Bq/g) for the Gamma and Intake Pathways [FN(1)]
2	

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1	
2	

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

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1	Feet of Uncon-	Feet of Vertical Extent of Residual Radionuclides (VE)							
	taminated								
2	Surface	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8
	Soil								
	(USS)								
3	Ra226								
4	Re-								
	stricted								
	Use								
5	Stand-	USS 1	0.67	0.55	0.37	0.30	0.22	0.18	0.15
	ards								
6		USS 2	0.67	0.56	0.37	0.30	0.22	0.18	0.18
7		USS 3	0.67	0.56	0.37	0.30	0.22	0.22	0.22
8		USS 4	0.67	0.56	0.37	0.30	0.23	0.23	0.26
9		USS 5	0.67	0.56	0.37	0.33	0.33	0.33	0.33

10

\*\*\*\*\*

\*\*\*\*\* This is piece: 2

\*\*\*\*\*

1

2 VE9

3

4

5 0.15

6 0.18

7 0.22

8 0.26

9 0.33

10

[FN(1)] These Ra226 concentration numbers may be used only when more than one radionuclide is present for the sum of the fractions rule at N.J.A.C. 7:28-12.9(b).

## Appendix B

Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways [FN(1)]

Feet of Uncontam-  
inated

Feet of Vertical Extent of Residual Radionuclide (VE)

Surface Soil (USS)

VE1

VE2

VE3

VE4

VE5

VE6

VE7

VE8

VE  
9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

\*\*\*\*\*

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\*\*\*\*\*

1

Ra226

2	Unres- tricted	USS 1	5*	3*	3	3	3	3	2	2
---	-------------------	-------	----	----	---	---	---	---	---	---

3	Use	USS 2	7*	4*	4*	3*	3	3	2	2
4	Pre-mixing	USS 3	7	5*	4*	4	3	3	3	3
5	Values	USS 4	11	7*	5*	4	3	3	3	3
6		USS 5	13*	8	6	4	4	4	4	4
7	Ra226									
8	Limited	USS 1	11*	8*	7*	7*	6*	6*	5*	5*
9	Re-streic- ted	USS 2	16*	11*	9*	8*	7*	6*	6*	5*
10	Use	USS 3	21*	13*	10*	9*	7*	6*	6*	6*
11	Pre-mixing	USS 4	26*	16*	12*	9*	8*	7*	7*	6*
12	Values	USS 5	31*	18*	11*	10*	9*	8*	7*	7*
13										

\*\*\*\*\*

\*\*\*\*\* This is piece: 2

\*\*\*\*\*

1	
2	2
3	2
4	3
5	3
6	4
7	
8	5*
9	5*
10	6*
11	6*
12	7*
13	

\* Back-calculated to ensure 15 mrem/yr TEDE after mixing

Allowed Incremental Derived Concentration Guideline Levels (Bq/g) for the Gamma and Intake Pathways [FN(1)]

Feet of Uncontam-

Feet of Vertical Extent of Residual Radionuclide (VE)

inated

Surface Soil (USS)

VE1

VE2

VE3

VE4

VE5

VE6

VE7

VE8

VE

9

[Note: The following table/form is too wide to be printed on a single page. For meaningful review of its contents the table must be assembled with part numbers in ascending order from left to right. Row numbers, which are not part of the original data, have been added in the margins and can be used to align rows across the parts.]

\*\*\*\*\*

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\*\*\*\*\*

1	Ra226									
2	Unres- tricted	USS 1	0.18*	0.12*	0.12*	0.12*	0.12	0.10	0.09	0.08
3	Use	USS 2	0.25*	0.15*	0.15*	0.15*	0.12*	0.11	0.09	0.09
4	Pre- mixing	USS 3	0.25*	0.18*	0.17*	0.17	0.14	0.11	0.11	0.11
5	Values	USS 4	0.40*	0.25*	0.18*	0.17	0.13	0.13	0.13	0.13
6		USS 5	0.48*	0.32	0.22	0.16	0.16	0.16	0.16	0.16
7	Ra226									
8	Limited	USS 1	0.40*	0.30*	0.26*	0.26*	0.22*	0.22*	0.18*	0.18*
9	Re- stricted	USS 2	0.59*	0.40*	0.33*	0.30*	0.26*	0.22*	0.22*	0.18*
10	Use	USS 3	0.77*	0.48*	0.37*	0.33*	0.26*	0.22*	0.22*	0.22*
11	Pre- mixing	USS 4	0.96*	0.59*	0.44*	0.33*	0.30*	0.26*	0.26*	0.22*
12	Values	USS 5	1.15*	0.67*	0.41*	0.37*	0.33*	0.30*	0.26*	0.26*
13										

\*\*\*\*\*

\*\*\*\*\* This is piece: 2

\*\*\*\*\*

1										
2	0.08									
3	0.09									
4	0.11									
5	0.13									
6	0.16									
7										

8	0.18*
9	0.18*
10	0.22*
11	0.22*
12	0.26*
13	

\* Back-calculated to ensure 15 mrem/yr TEDE after mixing

[FN(1)] These Ra226 concentration numbers may be used only when more than one radionuclide is present for the sum of the fractions rule at N.J.A.C. 7:28-12.9(b).

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Page 1

## New Jersey Administrative Code Currentness

## Title 7. Department of Environmental Protection

## Chapter 28. Radiation Protection Programs (Refs &amp; Annos)

## → Subchapter 58. Domestic Licensing of Source Material

## → 7:28-58.1 Incorporation by reference

(a) Except as set forth in (b) and (c) below, this subchapter incorporates by reference 10 CFR Part 40, Domestic Licensing of Source Material.

(b) The following provisions of 10 CFR Part 40 are not incorporated by reference. If there is a cross reference to a Federal citation specifically entirely excluded from incorporation, then the cross referenced citation is not incorporated by virtue of the cross reference:

1. 10 CFR 40.2a, Coverage of inactive tailings sites;
2. 10 CFR 40.4, Definitions. The following definitions in 10 CFR 40.4 are not incorporated by reference: "Commission," "decommission," and "license";
3. 10 CFR 40.5, Communications;
4. 10 CFR 40.8, Information collection requirements: OMB approval;
5. 10 CFR 40.12(b), Carriers;
6. 10 CFR 40.20(b) and (c), Types of licenses;
7. 10 CFR 40.23, General license for carriers of transient shipments of natural uranium other than in the form of ore or ore residue;
8. 10 CFR 40.26, General license for possession and storage of byproduct material as defined in this part;
9. 10 CFR 40.27, General license for custody and long-term care of residual radioactive material disposal sites;
10. 10 CFR 40.28, General license for custody and long-term care of uranium or thorium byproduct materials disposal sites;

11. 10 CFR 40.31(c), (f) through (h), (j), (k), (l), Application for specific licenses;
12. 10 CFR Part 40.32(d), (e), (g), General requirements for issuance of specific licenses;
13. 10 CFR 40.33, Issuance of a license for a uranium enrichment facility;
14. 10 CFR 40.35(f), Conditions of specific licenses issued pursuant to §40.34;
15. 10 CFR 40.38, Ineligibility of certain applicants;
16. 10 CFR 40.41(d), (e)(1), (e)(3), and (g), Terms and conditions of licenses;
17. 10 CFR 40.51(b)(6), Transfer of source or byproduct material;
18. 10 CFR 40.64, Reports;
19. 10 CFR 40.65, Effluent monitoring reporting requirements;
20. 10 CFR 40.66, Requirements for advance notice of export shipments of natural uranium;
21. 10 CFR 40.67, Requirement for advance notice for importation of natural uranium from countries that are not party to the Convention on the Physical Protection of Nuclear Material; and
22. 10 CFR 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 from Ores Processed Primarily for Their Source Material Content.

(c) The following provisions of 10 CFR Part 40 are incorporated by reference with the specified changes:

1. "Commission," "Nuclear Regulatory Commission," "NRC," and "U.S. Nuclear Regulatory Commission," as used in the provisions of Part 40 of the Code of Federal Regulations that are incorporated by reference, means the Department, except when specifically noted in this subchapter;
2. "Registrant" as used in the provisions of Part 40 of the Code of Federal Regulations that are incorporated by reference, means a "radioactive materials registrant" except when specifically noted;
3. 10 CFR 40.6, delete "Except as specifically authorized by the Commission in writing, no" with "No," and

replace "by the General Counsel" with "signed and approved by the Commissioner of the Department,";

4. 10 CFR 40.9(b), replace "Administrator of the appropriate Regional Office" with "Department";

5. 10 CFR 40.14(a), replace "Commission" with "Department, with approval of the Commission on Radiation Protection," and replace "by law and will not endanger life or property or the common defense and security and are otherwise in the public interest" with "in accordance with the provisions of N.J.A.C. 7:28-2.8";

6. 10 CFR 40.21, delete "or byproduct material";

7. 10 CFR 40.22(b), replace "parts 19, 20, and 21, of this chapter" with "part 21 of this chapter and N.J.A.C. 7:28-6 and N.J.A.C. 7:28-50";

8. 10 CFR 40.25(c)(1), replace "NRC Form 244, "Registration Certificate--Use of Depleted Uranium Under General License" with "forms available from the Department";

9. 10 CFR 40.25(c)(2), replace "Director, Division of Industrial and Medical Nuclear Safety, with a copy to the Regional Administrator of the appropriate U.S. Nuclear Regulatory Commission Regional Office listed in appendix D of part 20 of this chapter" with "Department";

10. 10 CFR 40.25(d)(4), replace "Director, Division of Industrial and Medical Nuclear Safety, with a copy to the Regional Administrator of the appropriate U.S. Nuclear Regulatory Commission Regional Office listed in appendix D of part 20 of this chapter" with "Department";

11. 10 CFR 40.25(e), delete "parts 19, 20, and 21, of this chapter" with "part 21 of this chapter and N.J.A.C. 7:28-6 and N.J.A.C. 7:28-50";

12. 10 CFR 40.31(a), replace "NRC Form 313, 'Application for Material License,' in accordance with the instructions in §40.5 of this chapter" with "forms available from the Department";

13. 10 CFR 40.31(e), replace "§170.31" with "N.J.A.C. 7:28-64";

14. 10 CFR 40.34(a)(2), replace "§20.1201(a)" with "N.J.A.C. 7:28-6";

15. 10 CFR 40.25(c)(1), (c)(2), and (d)(3), add "or Department equivalent" after "'Registration Certificate--Use of Depleted Uranium Under General License,'";

16. 10 CFR 40.35(d)(1) and (d)(2), add “or Department equivalent” after “Registration Certificate-Use of Depleted Uranium Under General License,”;

17. 10 CFR 40.35(e)(1), replace “Director, Office of Nuclear Material Safety and Safeguards” with “Department”;

18. 10 CFR 40.31(c), replace “regulations contained in parts 2 and 9 of this chapter” with “the Open Public Records Act (N.J.S.A. 47:1A-1 et seq.)”;

19. 10 CFR 40.31(e), replace “part 170” with “Subchapter 64” and “§170.31” with “Subchapter 64”;

20. 10 CFR 40.36(e)(2), replace “part 30” with “Subchapter 51”;

21. 10 CFR 40.36(f)(3)(i), replace “10 CFR 20.1003” with “N.J.A.C. 7:28-6”;

22. 10 CFR 40.36(f)(3)(iii), replace “10 CFR 20.2108” with “N.J.A.C. 7:28-6”;

23. 10 CFR 40.36(f)(3)(iv), replace “10 CFR part 20, subpart E” with “N.J.A.C. 7:28-12” and replace “10 CFR 20.2002” with “N.J.A.C. 7:28-6”;

24. 10 CFR 40.41(c), replace “part 71” with “N.J.A.C. 7:28-61”;

25. 10 CFR 40.41(f)(1), replace “appropriate NRC Regional Administrator” with “Department”;

26. 10 CFR 40.42(j)(2), replace “10 CFR part 20, subpart E” with “N.J.A.C. 7:28-12”;

27. 10 CFR 40.42(k)(3)(i), replace “10 CFR part 20, subpart E” with “N.J.A.C. 7:28-12”;

28. 10 CFR 40.42(k)(3)(ii), replace “10 CFR part 20, subpart E” with “N.J.A.C. 7:28-12”;

29. 10 CFR 40.43(a), add “or Department equivalent” after “NRC Form 313”;

30. 10 CFR 40.44, add “or Department equivalent” after “NRC Form 313”;

31. 10 CFR 40.60(b)(1)(ii), replace “appendix B of §§20.1001-20.2401 of 10 CFR part 20” with “N.J.A.C. 7:28-6”;

32. 10 CFR 40.60(b)(4)(i), replace "appendix B of §§20.1001-20.2401 of 10 CFR part 20" with "N.J.A.C. 7:28-6";

33. 10 CFR 40.60(c)(2), replace "NRC's Document Control Desk" with "Department" and replace "appropriate NRC regional office listed in appendix D to part 20 of this chapter" with "Department";

34. 10 CFR 40.61(d)(1), replace "§20.2002, (including burials authorized before January 28, 1981), 20.2003, 20.2004, 20.2005" with "N.J.A.C. 7:28-6";

35. 10 CFR 40.61(d)(2), replace "§20.2103(b)(4)" with "N.J.A.C. 7:28-6";

36. 10 CFR 40.61(e)(1), replace "§20.2002, 20.2003, 20.2004, 20.2005" with "N.J.A.C. 7:28-6"; and

37. 10 CFR 40.61(e)(2), replace "§20.2103(b)(4)" with "N.J.A.C. 7:28-6."

(d) For those facilities whose radioactive materials are licensed solely by the Department, NRC Form 3, "Notice to Employees" shall mean the Department's Form RPP-14, "Notice to Employees, Standards for Protection Against Radiation," available from the Department via the Department's website at: [www.nj.gov/dep/rpp/rms/rmsdown.htm](http://www.nj.gov/dep/rpp/rms/rmsdown.htm), or by requesting a copy by telephone during business hours at (609) 984-5462.

(e) Those facilities which possess a license from the Department and the NRC for radioactive materials shall post both the NRC's Form 3, "Notice to Employees" and the Department's Form RPP-14, "Notice to Employees, Standards for Protection Against Radiation."

(f) Reports that are to be submitted to the Department pursuant to this subchapter shall be submitted to the address at N.J.A.C. 7:28-1.5.

(g) Requests for adjudicatory hearings shall be made in accordance with N.J.A.C. 7:28-4.17, and requirements governing requests for stay of the effective date of the Department decision for which an adjudicatory hearing is requested are set forth at N.J.A.C. 7:28-4.18.

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N.J.S.A. 26:2D-9

Page 1

C

Effective:[See Text Amendments]

New Jersey Statutes Annotated Currentness

Title 26. Health and Vital Statistics (Refs &amp; Annos)

Chapter 2D. Radiation Protection (Refs &amp; Annos)

I. Radiation Protection Act

→ → 26:2D-9. Duties of department

The department shall:

- (a) Administer this act and codes, rules or regulations promulgated by the commission;
- (b) Provide the commission with the necessary personnel required to carry out its duties;
- (c) Develop comprehensive policies and programs for the evaluation and determination of hazards associated with the use of radiation, and for their amelioration;
- (d) Advise, consult, and cooperate with other agencies of the State, the Federal Government, other states and interstate agencies, and with affected groups, political subdivisions and industries;
- (e) Accept and administer according to law loans, grants or other funds or gifts from the Federal Government and from other sources, public or private, for carrying out its functions under this act;
- (f) Encourage, participate in or conduct studies, investigations, training, research and demonstrations relating to the control of radiation hazards, the measurement of radiation, the effects on health of exposure to radiation and related problems as it may deem necessary or advisable for the discharge of its duties under this act;
- (g) Collect and disseminate health education information relating to radiation protection;
- (h) Require registration of sources of radiation, and require records concerning sources of radiation to be kept in such manner as may be prescribed by codes, rules or regulations of the commission;
- (i) Review plans and specifications on the design and shielding for radiation sources submitted pursuant to codes, rules or regulations of the commission for the purpose of determining possible radiation hazards;

(j) Enter and inspect any building or place for the purpose of investigating an actual or suspected source of radiation and ascertaining compliance with this act or any rule, regulation or order promulgated or issued pursuant thereto and inspect radiation sources, their shielding and immediate surroundings and records concerning their operation for the determination of any possible radiation hazard;

(k) Have power, to be exercised subject to codes, rules and regulations of the commission, to require, issue, renew, amend, suspend and revoke licenses for the construction, operation or maintenance of sources of radiation including byproduct materials, source materials and special nuclear materials in quantities not sufficient to form a critical mass. The codes, rules and regulations may provide for recognition of other State or Federal licenses, subject to the registration requirements prescribed by or under the authority of this act;

(l) Have the power in accordance with a fee schedule adopted as a rule or regulation in accordance with the "Administrative Procedure Act," P.L.1968, c. 410 (C. 52-14B-1 et seq.), to establish and charge fees for any of the services it performs, which fees shall be annual or periodic as the department shall determine. The fees charged by the department pursuant to this section shall be based on criteria contained in the fee schedule. The criteria shall reflect the actual or projected expense incurred by the department in the performance of the service for which the fee is charged;

(m) Be empowered to issue orders for the implementation and enforcement of the provisions of this act or of any rule or regulation promulgated pursuant hereto.

#### CREDIT(S)

L.1958, c. 116, p. 594, § 9. Amended by L.1961, c. 124, p. 742, § 1; L.1971, c. 155, § 2, eff. June 1, 1971; L.1981, c. 296, § 3, eff. Oct. 9, 1981.

#### CROSS REFERENCES

Obstructing administration of law or other governmental function, see N.J.S.A. § 2C:29-1.

Obstruction, hindrance, delay or interference of personnel of department in performance of duties, see N.J.S.A. § 26:2D-23.

N. J. S. A. 26:2D-9, NJ ST 26:2D-9

Current with laws effective through L.2011, c. 216, 218-232 and J.R. No. 10.

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