

APPENDIX A

Radiological Guidelines used by DOE and NRC

NOTE: The guidelines provided in this Appendix are treated by the DOE and NRC as target values and may be modified by the responsible regulatory agency, based on site specific conditions and consideration of the ALARA philosophy. They are provided here, primarily to provide the reader with an idea of the approximate levels of interest.

**U.S. DEPARTMENT OF ENERGY
EXCERPT FROM DOE ORDER 5400.5
RADIATION PROTECTION OF THE
PUBLIC AND THE ENVIRONMENT
FEBRUARY 8, 1990**

**Chapter IV
Residual Radioactive Material**

CHAPTER IV

RESIDUAL RADIOACTIVE MATERIAL

1. PURPOSE. This chapter presents radiological protection requirements and guidelines for cleanup of residual radioactive material and management of the resulting wastes and residues and release of property. These requirements and guidelines are applicable at the time the property is released. Property subject to these criteria includes, but is not limited to sites identified by the Formerly Utilized Sites Remedial Action Program (FUSRAP) and the Surplus Facilities Management Program (SFMP). The topics covered are basic dose limits, guidelines and authorized limits for allowable levels of residual radioactive material, and control of the radioactive wastes and residues. This chapter does not apply to uranium mill tailings or to properties covered by mandatory legal requirements.
2. IMPLEMENTATION. DOE elements shall develop plans and protocols for the implementation of this guidance. FUSRAP sites shall be identified, characterized, and designated, as such, for remedial action and certified for release. Information on applications of the guidelines and requirements presented herein, including procedures for deriving specific property guidelines for allowable levels of residual radioactive material from basic dose limits, is contained in DOE/CH 8901. "A Manual for Implementing Residual Radioactive Material Guidelines, A Supplement to the U.S. Department of Energy Guidelines for Residual Radioactive Material at FUSRAP and SFMP Sites," June 1989.
 - a. Residual Radioactive Material. This chapter provides guidance on radiation protection of the public and the environment from:
 - (1) Residual concentrations of radionuclides in soil (for these purposes, soil is defined as unconsolidated earth material, including rubble and debris that might be present in earth material);
 - (2) Concentrations of airborne radon decay products;
 - (3) External gamma radiation.
 - (4) Surface contamination; and

- (5) Radionuclide concentrations in air or water resulting from or associated with any of the above.
- b. Basic Dose Limit. The basic dose limit for doses resulting from exposures to residual radioactive material is a prescribed standard from which limits for quantities that can be monitored and controlled are derived; it is specified in terms of the effective dose equivalent as defined in this Order. The basic dose limits are used for deriving guidelines for residual concentrations of radionuclides in soil. Guidelines for residual concentrations of thorium and radium in soil, concentrations of airborne radon decay products, allowable indoor external gamma radiation levels, and residual surface contamination concentrations are based on existing radiological protection standards (40 CFR Part 192; NRC Regulatory Guide 1.86 and subsequent NRC guidance on residual radioactive material). Derived guidelines or limits based on the basic dose limits for those quantities are used only when the guidelines provided in the existing standards are shown to be inappropriate.
 - c. Guideline. A guideline for residual radioactive material is a level of radioactive material that is acceptable for use of property without restrictions due to residual radioactive material. Guidelines for residual radioactive material presented herein are of two kinds, generic and specific. The basis for the guidelines is generally a presumed worst-case plausible-use scenario for the property.
 - (1) Generic guidelines, independent of the property, are taken from existing radiation protection standards. Generic guideline values are presented in this chapter.
 - (2) Specific property guidelines are derived from basic dose limits using specific property models and data. Procedures and data for deriving specific property guideline values are given by DOE/CH 8901.
 - d. Authorized Limit. An authorized limit is a level of residual radioactive material that shall not be exceeded if the remedial action is to be considered completed and the property is to be released without restrictions on use due to residual radioactive material.
 - (1) The authorized limits for a property will include:
 - (a) Limits for each radionuclide or group of radionuclides, as appropriate, associated with residual radioactive material in soil or in surface contamination of structures and equipment.

- (b) Limits for each radionuclide or group of radionuclides, as appropriate, in the air or water; and
 - (c) Where appropriate, a limit on external gamma radiation resulting from the residual material.
 - (2) Under normal circumstances expected at most properties, authorized limits for residual radioactive material are set equal to, or below guideline values. Exceptional conditions for which authorized limits~ might differ from guideline values are specified in paragraphs IV-5 and IV-7.
 - (3) A property may be released without restrictions if residual radioactive material does not exceed the authorized limits or approved supplemental limits, as defined in paragraph IV.7a, at the time remedial action is completed. DOE actions in regard to restrictions and controls on use of the property shall be governed by provisions in paragraph IV. 7b. The applicable controls and restrictions are specified in paragraph IV. 6 and IV. 7.c.
- e. ALARA Applications. The monitoring, cleanup, and control of residual radioactive material are subject to the ALARA policy of this Order Applications of ALARA policy shall be documented and filed as permanent record.

3. BASIC DOSE LIMITS.

- a. Defining and Determining Dose Limits. The basic public dose limits for exposure to residual radioactive material, in addition to natural occurring “background” exposures, are 100 mrem (1 mSv) effective dose equivalent in a year, as specified in paragraph II.1a.
- b. Unusual Circumstances. If, under unusual circumstances, it is impracticable to meet the basic limit based on realistic exposure scenarios, the respective project and/or program office may, pursuant to paragraph II.1a(4), request from EH-1 for a specific authorization for a temporary dose limit higher than 100 mrem (1 mSv), but not greater than 500 mrem (5mSv), in a year. Such unusual circumstances may include temporary conditions at a properly scheduled for remedial action or following the remedial action. The ALARA process shall apply to the selection of temporary dose limits.

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4. GUIDELINES FOR RESIDUAL RADIOACTIVE MATERIAL.

- a. Residual Radionuclides in Soil. Generic guidelines for thorium and radium are specified below. Guidelines for residual concentrations of other radionuclides shall be derived from the basic dose limits by means of an environmental pathway analysis using specific property data where available. Procedures for these derivations are given in DOE/CH-8901. Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 m².
- (1) Hot Spots. If the average concentration in any surface or below-surface area less than or equal to 25, exceeds the limit or guideline by a factor of (100/A), [where A is the area (in square meters) of the region in which concentrations are elevated], limits for “hot-spots” shall also be developed and applied. Procedures for calculating these hot-spot limits, which depend on the extent of the elevated local concentrations, are given in DOE/CH-8901. In addition, reasonable efforts shall be made to remove any source of radionuclide that exceeds 30 times the appropriate limit for soil, irrespective of the average concentration in the soil.
 - (2) Generic Guidelines. The generic guidelines for residual concentrations of Ra-226, Ra-228, Th-230, and Th-232 are:
 - (a) 5 pCi/g, averaged over the first 15 cm of soil below the surface; and
 - (b) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.
 - (3) Ingrowth and Mixtures. These guidelines take into account ingrowth of Ra-226 from Th-230 and of Ra-228 from Th-232, and assume secular equilibrium. If both Th-230 and Ra-226 or both Th-232 and Ra-228 are present and not in secular equilibrium, the appropriate guideline is applied as a limit for the radionuclide with the higher concentration. If other mixtures of radionuclide occur, the concentrations of individual radionuclides shall be reduced so that either the dose for the mixtures will not exceed the basic dose limit or the sum of the ratios of the soil concentration of each radionuclide to the allowable limit for that radionuclide will not exceed 1. Explicit formulas for calculating residual concentration guidelines for mixtures are given in DOE/CH-8901.

- b. Airborne Radon Decay Products. Generic guidelines for concentrations of airborne radon decay products shall apply to existing occupied or habitable structures on private property that are intended for release without restriction; structures that will be demolished or buried are excluded. The applicable generic guideline (40 CFR Part 192) is: In any occupied or habitable building, the objective of remedial action shall be, and a reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. [A working level (WL) is any combination of short lived radon decay products in 1 L of air that will result in the ultimate emission of 1.3 x MeV of potential alpha energy.] In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Remedial actions by DOE are not required in order to comply with this guideline when there is reasonable assurance that residual radioactive material is not the source of the radon concentration.

- c. External Gamma Radiation. The average level of gamma radiation inside a building or habitable structure on a site to be released without restrictions shall not exceed the background level by more than 20 $\mu\text{R/h}$ and shall comply with the basic dose limit when an “appropriate-use” scenario is considered. This requirement shall not necessarily apply to structures scheduled for demolition or to buried foundations. External gamma radiation levels on open lands shall also comply with the basic limit and the ALARA process, considering appropriate-use scenarios for the area.

- d. Surface Contamination. The generic surface contamination guidelines provided in Figure IV-1 are applicable to existing structures and equipment. These guidelines are generally consistent with standards of the NRC (NRC 1982) and functionally equivalent to Section 4, “Decontamination for Release for Unrestricted Use,” of Regulatory Guide 1.86, but apply to nonreactor facilities. These limits apply to both interior equipment and building components that are potentially salvageable or recoverable scrap. If a building is demolished, the guidelines in paragraph IV.6a are applicable to the resulting contamination in the ground.

- e. Residual Radionuclides in Air and Water. Residual concentrations of radionuclides in air and water shall be controlled to the required levels shown in paragraph II.1a and as required by other applicable Federal and/or State laws.

AUTHORIZED LIMITS FOR RESIDUAL RADIOACTIVE MATERIAL.

- a. Establishment of Authorized Limits. The authorized limits for each property shall be set equal to the generic or derived guidelines unless it can be established, on the basis of specific property data (including health, safety, practical, programmatic and socioeconomic considerations), that the guidelines are not appropriate for use at the specific property. The authorized limits shall be established to (1) provide that, at a minimum, the basic dose limits of in paragraph IV.3, will not be exceeded under the “worst case” or “plausible-use” scenarios, consistent with the procedures and guidance provided in DOE/CH-8901, or (2) be consistent with applicable generic guidelines. The authorized limits shall be consistent with limits and guidelines established by other applicable Federal and State laws. The authorized limits are developed through the project offices in the field and are approved by the Headquarters Program Office.

Figure IV-1
SURFACE CONTAMINATION GUIDELINES

Radionuclides ^b	Allowable Total Residual Surface Contamination (dpm/100 cm ²) ^a		
	Average ^{c,d}	Maximum ^{d,e}	Removable ^{d,f}
Transuranics, Ra-226, Ra-228, Th-230 Th-228, Pa-231, Ac-227, I-125, I-129	100	300	20
Th-Natural, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay products	5,000 α	15,000 α	1,000 α
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 β - γ	15,000 β - γ	1,000 β - γ
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- ^a As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- ^b Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.
- ^c Measurements of average contamination should not be averaged over an area of more than 1 m². For objects of less surface area, the average should be derived for each such object.
- ^d The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at a depth of 1 cm.
- ^e The maximum contamination level applies to an area of not more than 100 cm².
- ^f The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm² is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. The numbers in this column are maximum amounts.
- ^g This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

- b. Application of Authorized Limits. Remedial action shall not be considered complete until the residual radioactive material levels comply with the authorized limits, except as authorized pursuant to paragraph IV.7 for special situations where the supplemental limits and exceptions should be considered and it is demonstrated that it is not appropriate to decontaminate the area to the authorized limit or guideline value.
6. CONTROL OF RESIDUAL RADIOACTIVE MATERIAL. Residual radioactive material above the guidelines shall be managed in accordance with Chapter II and the following requirements.
- a. Operational and Control Requirements. The operational and control requirements specified in the following Orders shall apply to interim storage, interim management, and long-term management.
 - (1) DOE 5000.3B, Occurrence Reporting and Processing of Operations Information
 - (2) DOE 5440.1E, National Environmental Policy Act Compliance Program

- (3) DOE 5480.4, Environmental Protection, Safety, and Health Protection

Standards

- (4) DOE 5482.1B, Environmental, Safety, and Health Appraisal Program
- (5) DOE 5483.1A, Occupational Safety and Health Program for DOE Employees at Government-Owned, Contractor-Operated Facilities
- (6) DOE 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements
- (7) DOE 5820.2A, Radioactive Waste Management.

Vertical line denotes change.

**NRC RADIOLOGICAL CRITERIA
FOR
LICENSE TERMINATION**

20.2110, 20.2201, 20.2202, 20.2203, 20.2204, 20.2205, 20.2206, 20.2301, and Appendices F and G to 10 CFR Part 20.

* * * * *

4. A new subpart E entitled "Radiological Criteria for License Termination," is added to 10 CFR part 20 to read as follows:

Subpart E—Radiological Criteria for License Termination

Sec.

- 20.1401 General provisions and scope.
- 20.1402 Radiological criteria for unrestricted use.
- 20.1403 Criteria for license termination under restricted conditions.
- 20.1404 Alternate criteria for license termination.
- 20.1405 Public notification and public participation.
- 20.1406 Minimization of contamination.

§ 20.1401 General provisions and scope.

(a) The criteria in this subpart apply to the decommissioning of facilities licensed under parts 30, 40, 50, 60, 61, 70, and 72 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 and 61), 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 to 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 decommissioning 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, 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.

§ 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 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.

§ 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 governmental 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 and 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 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 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 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 among the participants 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 newspapers, letters to State or 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.

Applicants for licenses, other than renewals, 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.

5. In § 20.2402, paragraph (b) is revised to read as follows:

§ 20.2402 Criminal penalties.

* * * * *

(b) The regulations in §§ 20.1001 through 20.2402 that are not issued under Sections 161b, 161i, or 161o for the purposes of Section 223 are as follows: §§ 20.1001, 20.1002, 20.1003, 20.1004, 20.1005, 20.1006, 20.1007, 20.1008, 20.1009, 20.1405, 20.1704, 20.1903, 20.1905, 20.2002, 20.2007, 20.2301, 20.2302, 20.2401, and 20.2402.

PART 30—RULES OF GENERAL APPLICABILITY TO DOMESTIC LICENSING OF BYPRODUCT MATERIAL

6. The authority citation for part 30 continues to read as follows:

Authority: Secs. 81, 82, 161, 182, 183, 186, 68 Stat. 935, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2111, 2112, 2201, 2232, 2233, 2236, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 30.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 2902, 106 Stat. 3123 (2 U.S.C. 5851). Section 30.34(b) also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 30.61 also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

7. In § 30.4, the definition of *Decommission* is revised to read as follows:

§ 30.4 Definitions.

* * * * *

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.

* * * * *

requirements with respect to at least one contention will not be permitted to participate as a party.

Those permitted to intervene become parties to the proceeding, subject to any limitations in the order granting leave to intervene, and have the opportunity to participate fully in the conduct of the hearing, including the opportunity to present evidence and cross-examine witnesses. Since the Commission has made a final determination that the amendment involves no significant hazards consideration, if a hearing is requested, it will not stay the effectiveness of the amendment. Any hearing held would take place while the amendment is in effect.

A request for a hearing or a petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemakings and Adjudications Staff or may be delivered to the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, by the above date. A copy of the petition should also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the attorney for the licensee.

Nontimely filings of petitions for leave to intervene, amended petitions, supplemental petitions and/or requests for a hearing will not be entertained absent a determination by the Commission, the presiding officer or the Atomic Safety and Licensing Board that the petition and/or request should be granted based upon a balancing of the factors specified in 10 CFR 2.714(a)(1)(i)-(v) and 2.714(d).

Northern States Power Company, Docket Nos. 50-282 and 50-306, Prairie Island Nuclear Generating Plant, Units 1 and 2, Goodhue County, Minnesota

Date of application for amendments: October 23, 1998, as supplemented October 26, 1998.

Brief description of amendments: The amendments clarify the conditions that constitute operable Individual Rod Position Indication (IRPI) system channels, provide for an allowed out of service time for inoperable IRPI indicator channels, and provide compensatory measures to be taken when any channel is determined to be inoperable.

Date of issuance: October 30, 1998.

Effective date: October 30, 1998.

Amendment Nos.: 139 and 130.

Facility Operating License Nos. DPR-42 and DPR-60. Amendments revised the Technical Specifications.

Public comments requested as to proposed no significant hazards consideration: No.

The Commission's related evaluation of the amendments, finding of emergency circumstances, and final determination of no significant hazards consideration are contained in a Safety Evaluation dated October 30, 1998.

Attorney for licensee: J.E. Silberg, Esquire, Shaw, Pittman, Potts, and Trowbridge, 2300 N Street, NW, Washington, DC 20037.

Local Public Document Room location: Minneapolis Public Library, Technology and Science Department, 300 Nicollet Mall, Minneapolis, Minnesota 55401.

NRC Project Director: Cynthia A. Carpenter.

Dated at Rockville, Maryland, this 10th day of November 1998.

For the Nuclear Regulatory Commission.

William H. Bateman,

Acting Director, Division of Reactor Projects—III/IV, Office of Nuclear Reactor Regulation.

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NUCLEAR REGULATORY COMMISSION

Supplemental Information on the Implementation of the Final Rule on Radiological Criteria for License Termination

SUMMARY: This notice provides supplemental information regarding implementation of the Nuclear Regulatory Commission's (NRC's) Final Rule on Radiological Criteria for License Termination (License Termination Rule, LTR) which was issued on July 21, 1997 (62 FR 39058). The information provided in this notice pertains to: (1) The end of the "grandfathering period" on August 20, 1998; (2) issuance of the draft regulatory guide on the LTR for interim use; (3) availability of the NRC's screening computer code (DandD, Version 1) for calculating screening values to demonstrate compliance with the dose limits in the LTR; (4) screening values for building surface contamination for beta/gamma radiation emitters; (5) NRC plans to hold public workshops to discuss issues related to the draft guidance and implementation of the LTR; (6) staff plans to develop a standard review plan (SRP) for decommissioning; and (7) status of NRC decommissioning guidance documents.

SUPPLEMENTARY INFORMATION:

1. End of the Grandfathering Period

Subpart E to 10 CFR Part 20 contains a provision, 20.1401(b)(3), that the

criteria in the LTR do not apply to sites that submit a sufficient decommissioning plan (DP) or license termination plan (LTP) before August 20, 1998, provided the NRC approves the DP or the LTP before August 20, 1999, and the plan is in accordance with the criteria identified in the Site Decommissioning Management Plan (SDMP) Action Plan (57 FR 13389; April 16, 1992). The period from the effective date of the LTR, August 20, 1997 through August 20, 1998, is referred to as the "grandfathering period," during which the criteria in the SDMP Action Plan could continue to be proposed. This notice reminds licensees that the grandfathering period has ended, and that all future requests to terminate a license must be in accordance with the provisions in Part 20, Subpart E. Note that the NRC review of the licensee plans submitted in accordance with 10 CFR 20.1401(b)(3), incorporating the SDMP Action Plan criteria, will continue through August 20, 1999.

2. Draft Regulatory Guide

The NRC has issued Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria For License Termination," for a two-year interim use period (i.e., July 8, 1998 through July 7, 2000). NRC has also issued draft NUREG reports in support of DG-4006 (the applicable draft NUREG reports are referenced in DG-4006). A notice of availability of the Draft Regulatory Guide was published in the **Federal Register** on August 4, 1998 (63 FR 41604).

3. Availability of NRC DandD Screening Code

On August 20, 1998, NRC issued a screening computer code DandD, Version 1. The DandD code, when used with default parameters, is an acceptable method for licensees to calculate screening values to demonstrate compliance with the unrestricted use dose limit in the LTR. The DandD code can be installed by downloading the self-extracting program file, setup.exe, accessed through the web site: "<http://techconf.llnl.gov/radcri/java.html>," clicking on "dose assessment," and then on "decontamination and decommissioning software." The installation instruction file "readme.txt" can also be downloaded, using the above web site, to help users installing the code. Important support documents (e.g., NUREG-1549, "Decision Methods for Dose Assessment to Comply With Radiological Criteria for License Termination" and NUREG/CR-5512, Vol. #3, "Residual Radioactive

Contamination From Decommissioning, Parameter Analysis) can also be accessed through the above web site. As discussed in DG-4006, use of DandD with the default parameters is intended for screening calculations only. If screening results indicate that remediation might be needed, a site-specific dose assessment is recommended before deciding on remedial actions. NRC expects pathway analysis/dose assessment codes other than DandD to be more appropriate for some conditions. Regulatory Guide DG-4006 contains guidance regarding the information required to support the use of other codes and models. In the interim period, NRC will review all dose assessment results on a case-by-case basis.

The DandD code, when used with the default parameter set, provides a method for calculating screening concentrations for radionuclides in soil, and screening levels for surface contamination on building surfaces. It should be noted that the screening values, based on DandD, differ from the criteria listed in the SDMP Action Plan. In most cases, the screening values for beta/gamma emitters are higher than the SDMP Action Plan criteria, while the values for alpha emitters are much lower.

During the two-year interim use period for the draft guidance (DG-4006), NRC plans to continue to refine the screening approach and to evaluate the extent of conservatism of the results of the DandD code. It may be more appropriate to develop a different screening method or approach for alpha emitters. NRC will assess the results of the DandD screening method, particularly the low screening values for alpha emitters, during the workshops to be held on the LTR guidance development. Note that DG-4006 clearly encourages the use of site-specific dose assessments, whenever needed, and recognizes that the screening values will not be appropriate in all cases.

4. Screening Values for Building Surface Contamination

The staff has developed, as a tool to facilitate the efficient implementation of the LTR, a screening table (Table 1) of unrestricted release values for building surface contamination of common beta/gamma emitting radionuclides. The screening table was derived using the DandD screening code, Version 1, and its default input parameters. Table 1 provides criteria which permit licensees to demonstrate compliance with the unrestricted release dose criterion in the LTR. The values in Table 1 correspond to surface concentrations of

radionuclides contamination that would be deemed in compliance with the unrestricted use dose limit in 10 CFR 20.1402 (i.e., 0.25 mSv/yr, (25 mrem/yr)). The values correspond to screening "derived concentration guidelines" (DCGL) for each specific radionuclide based on the methodology described in DG-4006. Sites with building surface contamination levels below those listed in Table 1 would be deemed acceptable for release for unrestricted use in accordance with the dose criteria in 10 CFR 20.1402, provided that residual radioactivity has been reduced to "as low as reasonably achievable" (ALARA) levels. The table is intended for use as criteria to facilitate license termination for many simple routine decommissioning cases without a site-specific dose assessment. For facilities with contamination levels above those in Table 1, additional site-specific dose assessments may be necessary, and licensees should refer to DG-4006 regarding acceptable methods for conducting the appropriate dose assessment.

Table 1 does not include screening values for radionuclides that emit alpha particles, or for soil contamination. The NRC staff is assessing current screening approaches for sites with alpha emitters and for soil contamination. For such sites, licensees are encouraged to use, in the interim period, site-specific dose assessments based on actual site conditions.

5. Future Public Workshops

NRC will hold a series of public workshops over the two-year interim period to describe the status of the ongoing development of both DG-4006 and the SRP, to provide industry and other interested parties an opportunity to provide comments, and to discuss users' experiences with implementing the guidance. The future dates for the workshops are: December 1-2, 1998; January 21-22, 1999; March 18-19, 1999; June 16-17, 1999; August 18-19, 1999; and October 20-21, 1999. All workshops will be conducted in the Auditorium located at NRC's Headquarters (Two White Flint North Building, 11545 Rockville Pike, Rockville, MD 20852-2738). For further details on workshops, see the **Federal Register** notice published on October 21, 1998 (63 FR 56237).

6. Standard Review Plan

The NRC staff is developing an SRP for the evaluation of licensee submittals related to compliance with the radiological criteria in the LTR. The goal of the SRP is to enable NRC staff to evaluate information submitted by

licensees in a timely, efficient, and consistent manner, and to determine if the decommissioning will be conducted such that the public health and safety is protected and the facility can be released in accordance with NRC's requirements. The development of the SRP will be coordinated with the effort to revise and finalize DG-4006. The web site "<http://techconf.llnl.gov/cgi-bin/topics>" provides updated information on the status of the guidance and the SRP, and a mechanism for the public to provide comments on the draft guidance.

7. Status of Decommissioning Guidance Documents

Guidance material in DG-4006 and the SRP will incorporate or supersede most existing NRC decommissioning guidance documents. Guidance documents will be revised to be consistent with the LTR, or they will be phased out. Table 2 lists the status of existing NRC guidance documents affected by the LTR and associated new guidance.

Under the SDMP Action Plan criteria, the tables of surface contamination values contained in Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors," and Policy and Guidance Directive FC 83-23, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Byproduct, Source, or Special Nuclear Material Licenses," were used as the decommissioning criteria for building surfaces. The values in Table 1 are intended to replace the tables in the above two documents for license termination purposes.

The surface contamination criteria in Regulatory Guide 1.86 have been applied by reactor licensees for license termination only. However, for materials licenses (under 10 CFR Parts 30, 40, and 70), the guidelines in Policy and Guidance Directive FC 83-23 have been used by licensees for two purposes: (a) As criteria for license termination, and (b) as criteria for unrestricted release of equipment and other materials during operations. On June 30, 1998, the Commission directed the NRC staff to develop a dose-based regulation for clearance of equipment and materials having residual radioactivity. The criteria that eventually emerge from this rulemaking effort are intended to replace the surface contamination values in Policy and Guidance Directive FC 83-23. Until that time, licensees may continue to use the criteria in Policy and Guidance Directive FC 83-23 for unrestricted

release of equipment and material, to the extent authorized by their licenses.

FOR FURTHER INFORMATION CONTACT: Mr. David N. Fauver, Low-Level Waste and Decommissioning Projects Branch, at (301) 415-6625, or Dr. Rateb (Boby) Abu Eid, Performance Assessment and High-Level Waste Integration Branch, at (301) 415-5811, both of the Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Dated at Rockville, Maryland, this 12th day of November 1998.

For the Nuclear Regulatory Commission.
John W.N. Hickey,
Chief, Low-Level Waste and Decommissioning Projects Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards.

TABLE 1—ACCEPTABLE LICENSE TERMINATION SCREENING VALUES OF COMMON RADIONUCLIDES FOR BUILDING SURFACE CONTAMINATION

Radionuclide	Sym- bol	Acceptable screening levels ¹ for unrestricted release (dpm/100 cm ²) ²
Hydrogen-3 (Tritium).	³ H	1.2E+08
Carbon-14	¹⁴ C	3.7E+06
Sodium-22	²² Na	9.5E+03
Sulfur-35	³⁵ S	1.3E+07
Chlorine-36	³⁶ Cl	5.0E+05
Manganese-54 ..	⁵⁴ Mn	3.2E+04
Iron-55	⁵⁵ Fe	4.5E+06
Cobalt-60	⁶⁰ Co	7.1E+03
Nickel-63	⁶³ Ni	1.8E+06
Strontium-90	⁹⁰ Sr	8.7E+03
Technetium-99 ..	⁹⁹ Tc	1.3E+06
Iodine-129	¹²⁹ I	3.5E+04
Cesium-137	¹³⁷ Cs	2.8E+04

TABLE 1—ACCEPTABLE LICENSE TERMINATION SCREENING VALUES OF COMMON RADIONUCLIDES FOR BUILDING SURFACE CONTAMINATION—Continued

Radionuclide	Sym- bol	Acceptable screening levels ¹ for unrestricted release (dpm/100 cm ²) ²
Iridium-192	¹⁹² Ir	7.4E+04

¹ Screening levels are based on the assumption that the fraction of removable surface contamination is equal to 0.1. For cases when the fraction of removable contamination is undetermined or higher than 0.1, users may assume, for screening purposes, that 100% of surface contamination is removable, and therefore the screening levels should be decreased by a factor of 10. Alternatively, users having site-specific data on the fraction of removable contamination (e.g., within the 10% to 100% range) may calculate site-specific screening levels using DandD Version 1.

² Units are disintegrations per minute per 100 square centimeters (dpm/100 cm²). 1 dpm is equivalent to 0.0167 becquerel (Bq). The screening values represent surface concentrations of individual radionuclides that would be deemed in compliance with the 0.25 mSv/yr (25 mrem/yr) unrestricted release dose limit in 10 CFR 20.1402. For radionuclides in a mixture, the "sum of fractions" rule applies; see 10 CFR Part 20, Appendix B, Note 4. Refer to NRC Draft Guidance DG-4006 for further information on application of the values in this table.

TABLE 2—EXISTING GUIDANCE DOCUMENTS APPLICABLE TO DECOMMISSIONING THAT WILL REQUIRE REVISION OR DISCONTINUATION IN ORDER TO IMPLEMENT THE LICENSE TERMINATION RULE (LTR)

Decommissioning guidance document	Status with respect to LTR
Decommissioning Criteria in Action Plan to Ensure Timely Cleanup of Site Decommissioning Management Plan Sites (SDMP Action Plan) (57 FR 13389).	Superseded by LTR and DG-4006 (Note: Still applicable to sites "grandfathered" in accordance with 10 CFR 20.1401(b)).
Policy and Guidance Directive FC 83-23, "Guidelines for the Decommissioning of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Byproduct, Source, or Special Nuclear Material Licenses".	Superseded by DG-4006 for License Termination (Note: This document may continue to be used as criteria for unrestricted release of equipment and material from licensed material facilities during operational activities prior to license termination, to the extent authorized by the licensees).
Draft Branch Technical Position on "Screening Methodology for Assessing Prior Land Burials of Radioactive Wastes Authorized Under Former 10 CFR 20.304 and 20.302" (96 FR 28223).	Superseded by LTR and DG-4006.
"Preliminary Hazards Analysis for Contaminated Buildings at Formerly Licensed Sites".	Superseded by DG-4006.
NUREG/BR-0241, "NMSS Handbook for Decommissioning Fuel Cycle and Materials Licensees".	References to decommissioning criteria are superseded by the LTR and DG-4006. The Handbook will be updated as appropriate to be consistent with the LTR and current guidelines.
Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors".	Superseded by DG-4006
Draft NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination".	Superseded by DG-4006.

[FR Doc. 98-30867 Filed 11-17-98; 8:45 am]
 BILLING CODE 7590-01-P

RAILROAD RETIREMENT BOARD

Sunshine Act Meeting

The meeting of the Railroad Retirement Board which was to be held on November 18, 1998, 9:00 a.m., at the Board's meeting room on the 8th floor of its headquarters building, 844 North

Rush Street, Chicago, Illinois 60611, has been canceled.

The person to contact for more information is Beatrice Ezerski, Secretary to the Board. Phone No. 312-751-4920.

Week of December 6

Wednesday, December 8

- 9:25 a.m. Affirmation Session (Public Meeting)
- a. Final Amendments to 10 CFR Parts 21, 50 & 54 & Availability for Public Comment of Draft Reg Guide DG-1081 & Draft Standard Review Plan of Section 15.0.1 Regarding Use of Alternative Source Terms at Operating Reactors (Tentative) (Contact: Ken Hart, 301-415-1659).

Week of December 13—Tentative

Wednesday, December 15

- 9:25 a.m. Affirmation Session (Public Meeting) (if needed)
- 9:30 a.m. Meeting with Advisory Committee on Nuclear Waste (ACNW) (Public Meeting) (Contact: Dr. John Larkins, 301-415-7360)

Thursday, December 16

- 9:00 a.m. Meeting on NRC Response to Stakeholders' Concerns Location: (NRC Auditorium, Two White Flint North)

Friday, December 17

- 9:30 a.m. Briefing on Status of RES Programs, Performance, and Plans (Including Status of Thermo-Hydraulics) (Public Meeting) (Contact: Jocelyn Mitchell, 301-415-5289)

Week of December 20—Tentative

Wednesday, December 22

- 11:30 a.m. Affirmation Session (Public Meeting) (if needed)

Week of December 27—Tentative

There are no meetings scheduled for the Week of December 27.

*The schedule for Commission meetings is subject to change on short notice. To verify the status of meetings call (recording)—(301) 415-1292. Contact person for more information: Bill Hill (301) 415-1661.

The NRC Commission Meeting Schedule can be found on the Internet at: <http://www.nrc.gov/SECY/smj/schedule.htm>

This notice is distributed by mail to several hundred subscribers; if you no longer wish to receive it, or would like to be added to it, please contact the Office of the Secretary, Attn: Operations Branch, Washington, D.C. 20555 (301-415-1661). In addition, distribution of this meeting notice over the Internet system is available. If you are interested in receiving this Commission meeting schedule electronically, please send an

electronic message to wmh@nrc.gov or dkw@nrc.gov.

William M. Hill, Jr.,

Secy, Tracking Officer, Office of the Secretary.
[FR Doc. 99-31798 Filed 12-3-99; 2:21 pm]

BILLING CODE 7590-01-M

NUCLEAR REGULATORY COMMISSION

Supplemental Information on the Implementation of the Final Rule on Radiological Criteria for License Termination

Summary: This notice provides supplemental information regarding implementation of the Nuclear Regulatory Commission's (NRC) Final Rule on Radiological Criteria for License Termination (License Termination Rule (LTR)) which was issued on July 21, 1997, (62 FR 39058). This notice provides: (1) screening values for surface soil contamination release levels; and (2) information on additional NRC efforts in dose modeling. Supplemental information was also published in the **Federal Register** on November 18, 1998 (63 FR 64132). That notice provided information on: (1) The end of the "grandfathering period;" (2) issuance of draft Regulatory Guide "Demonstrating Compliance with the Radiological Criteria for License Termination" (DG-4006); (3) availability of DandD, version 1; (4) screening values for building surface contamination for beta/gamma radiation emitters (Table 1, Acceptable License Termination Screening Values of Common Radionuclides for Building Surface Contamination); (5) public workshops; (6) development of a decommissioning standard review plan (SRP); and (7) status of the NRC decommissioning guidance documents (Table 2, Existing Guidance Documents Applicable to Decommissioning That Will Require Revision or Discontinuation in Order to Implement the License Termination Rule).

Supplemental Information: As discussed in the November 18, 1998, **Federal Register** notice, the DandD code provides a method for calculating screening concentrations for radionuclides in soil, and screening levels for contamination on building surfaces. NRC staff also stated that, during the two-year interim use period for DG-4006, it planned to continue to refine the screening approach and to evaluate the extent of conservatism in the DandD code.

Several areas where DandD, version 1, may be overly conservative have been identified. One such conservatism is the

methodology used for selection of default parameters. Selection of highly conservative default parameters is essentially caused by the current screening design of establishing a single default parameter set for all radionuclides listed in the DandD code. That is, if the default parameter set was tailored for each radionuclide, rather than using a common default parameter set for all radionuclides, the dose calculated using DandD model would, in most cases, be lower. A detailed discussion of the way the default parameters were selected is contained in "Residual Contamination from Decommissioning—Parameter Analysis—Draft Report for Comment" (NUREG/CR-5512, Volume 3).

This artifact in the way the default parameters were selected has been discussed in several presentations at the NRC's public workshops (e.g., Public Workshops on Guidance for Implementing Title 10 Code of Federal Regulations (CFR), Subpart E, Radiological Criteria for License Termination) conducted in December 1998, and January, March, and June 1999. Currently, NRC staff is developing version 2.0 of the DandD code. This version of the code will calculate the default parameter values based on the specific radionuclides that are identified by the analyst. In the interim, NRC staff has calculated surface soil concentrations for a number of common radionuclides that correspond to an annual dose of 0.25 mSv (25 mrem) using the default parameters that are generated by the approach to be used in the new version of DandD. These values are presented in Table 3. For mixtures of radionuclides, a screening dose should be calculated using the sum-of-the fractions' rule.

The values in Table 3 (Interim Screening Values (pCi/g) of Common Radionuclides for Soil Surface Contamination Levels) correspond to surface soil (e.g., top 15-30 cm) concentrations of radionuclide contamination that would be deemed in compliance with the unrestricted use dose limit in 10 CFR 20.1402 (i.e., 0.25 mSv/yr, (25 mrem/yr)). The values correspond to screening "derived concentration guidelines" (DCGLs) for each specific radionuclide based on the methodology described in DG-4006. Sites with surface soil contamination levels below those listed in Table 3 would be deemed acceptable for release for unrestricted use provided that residual radioactivity has been reduced to levels that are "as low as is reasonably achievable" (ALARA). This table is not applicable to sites with subsurface and/or with groundwater

contamination and a more comprehensive dose impact analysis would be required. The table is intended for use as screening criteria to facilitate license termination for many simple routine decommissioning cases that do not require a site-specific dose assessment. For facilities with contamination levels above those in Table 3, additional site-specific dose assessments may be necessary, and licensees should refer to DG-4006 regarding acceptable methods for conducting the appropriate dose assessment.

NRC staff has also prepared "Preliminary Guidelines for Evaluating Dose Assessments in Support of Decommissioning." The purpose of these guidelines is to provide a consistent approach for NRC staff to evaluate dose assessments conducted to demonstrate compliance with the LTR. This interim guidance was developed by NRC staff for reviewing dose assessments and may be useful to licensees preparing dose assessment during both screening and site-specific analyses. A copy of the guidance is available on the web site "http://techconf.llnl.gov/."

During our analysis of the basis for selecting the default parameter set for the DandD code, we discovered a transcription error in the soil-to-plant transfer factor for S-35. This error substantially overestimates the allowable DCGL for this radionuclide. The soil-to-plant transfer factor has been revised in DandD version 1 and posted on the above referenced web site. In addition, a "patch" to correct this problem for users that already have the code installed is also available from this web site.

The staff intends to consider placing Tables 1 and 3, revised as necessary, to reflect improvement in the DandD code in the Standard Review Plan for decommissioning, and/or in the next revision of the Regulatory Guide DG-4006. Comments on these Tables may be submitted within 30 days from the date of this notice to the Rules and Directives Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

For Further Information Contact: For more information, contact Dr. Boby Abu-Eid, High-Level Waste and Performance Assessment Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Telephone: (301) 415-5811; fax: (301) 415-5398; or email: bae@nrc.gov.

Dated at Rockville, Maryland, this 29th day of November 1999.

For the Nuclear Regulatory Commission.

Larry W. Camper,

Chief, Decommissioning Branch Division of Waste Management, Office of Nuclear Material Safety and Safeguards.

TABLE 3.1—INTERIM SCREENING VALUES² (PCI/G) OF COMMON RADIONUCLIDES FOR SOIL SURFACE CONTAMINATION LEVELS

Radionuclide	Surface soil screening values ³
H-3	1.1 E+02
C-14	1.2 E+01
Na-22	4.3 E+00
S-35	2.7 E+02
Cl-36	3.6 E-01
Ca-45	5.7 E+01
Sc-46	1.5 E+01
Mn-54	1.5 E+01
Fe-55	1.0 E+04
Co-57	1.5 E+02
Co-60	3.8 E+00
Ni-59	5.5 E+03
Ni-63	2.1 E+03
Sr-90	1.7 E+00
Nb-94	5.8 E+00
Tc-99	1.9 E+01
I-129	5.0 E-01
Cs-134	5.7 E+00
Cs-137	1.1 E+01
Eu-152	8.7 E+00
Eu-154	8.0 E+00
Ir-192	4.1 E+01
Pb-210	9.0 E-01
Ra-226	7.0 E-01
Ra-226+C ⁴	6.0 E-01
Ac-227	5.0 E-01
Ac-227+C	5.0 E-01
Th-228	4.7 E+00
Th-228+C	4.7 E+00
Th-230	1.8 E+00
Th-230+C	6.0 E-01
Th-232	1.1 E+00
Th-232+C	1.1 E+00
Pa-231	3.0 E-01
Pa-231+C	3.0 E-01
U-234	1.3 E+01
U-235	8.0 E+00
U-235+C	2.9 E-01
U-238	1.4 E+01
U-238+C	5.0 E-01
Pu-238	2.5 E+00
Pu-239	2.3 E+00
Pu-241	7.2 E+01
Am-241	2.1 E+00
Cm-242	1.6 E+02
Cm-243	3.2 E+00

¹ Tables 1 and 2 were published in the Federal Register on November 18, 1998, (63 FR 64132)

² These values represent superficial surface soil concentrations of individual radionuclides that would be deemed in compliance with the 25 mrem/y (0.25 mSv) unrestricted release dose limit in 10 CFR 20.1402. For radionuclides in a mixture, the "sum of fractions" rule applies; see Part 20, Appendix B, Note 4. Refer to NRC Draft Guidance DG-4006 for further information on application of the values in this table.

³ Screening values (pCi/g) equivalent to 25 mrem/y derived using DandD screening methodology (SNL Letter Report for NRC Project JCN W6227, January 30, 1998). These values were derived based on selection of the 90th Percentile of the output dose distribution for each specific radionuclide (or radionuclide with the specific decay chain). Behavioral parameters are set at the mean of the distribution of the assumed critical group. The Metabolic parameters are set at Standard Man or at the mean of the distribution for an average man.

⁴ "+C" indicates a value for a radionuclide with its decay progeny present in equilibrium. The values are concentrations of the parent radionuclide, but account for contributions from the complete chain of progeny in equilibrium with the parent radionuclide.

[FR Doc. 99-31508 Filed 12-6-99; 8:45 am]

BILLING CODE 7590-01-P

RAILROAD RETIREMENT BOARD

Agency Forms Submitted for OMB Review

SUMMARY: In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35), the Railroad Retirement Board (RRB) has submitted the following proposal(s) for the collection of information to the Office of Management and Budget for review and approval.

SUMMARY OF PROPOSAL(S):

- (1) *Collection title:* Application for Survivor Death Benefits.
- (2) *Form(s) submitted:* AA-21, G-273a, AA-11a, G-131, and AA-21cert.
- (3) *OMB Number:* 3220-0031.
- (4) *Expiration date of current OMB clearance:* 2/28/2000.
- (5) *Type of request:* Revision of a currently approved collection.
- (6) *Respondents:* Individuals or Households, Business or other for-profit.
- (7) *Estimated annual number of respondents:* 20,600.
- (8) *Total annual responses:* 20,600.
- (9) *Total annual reporting hours:* 5,150.
- (10) *Collection description:* The collection obtains the information needed to pay death benefits and annuities due but unpaid at death under the Railroad Retirement Act. Benefits are paid to designated beneficiaries or to survivors in a priority designated by law.

ADDITIONAL INFORMATION OR COMMENTS:

Copies of the forms and supporting documents can be obtained from Chuck Mierzwa, the agency clearance officer (312-751-3363). Comments regarding the information collection should be addressed to Ronald J. Hodapp, Railroad Retirement Board, 844 North Rush Street, Chicago, Illinois 60611-2092 and the OMB reviewer, Lori Schack (202-395-7316), Office of Management and

Dated: Rockville, Maryland, June 7, 2000.

G. Paul Bollwerk, III,

Administrative Judge.

[FR Doc. 00-14887 Filed 6-12-00; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

Use of Screening Values to Demonstrate Compliance With the Final Rule on Radiological Criteria for License Termination

Purpose: This notice provides supplemental information to clarify the criteria for using screening values to demonstrate compliance with the Nuclear Regulatory Commission's (NRC) Final Rule on Radiological Criteria for License Termination (License Termination Rule (LTR)) which was issued on July 21, 1997, (62 FR 39058).

Background: Acceptable license termination screening values of common radionuclides for building surface contamination were published in the **Federal Register** on November 18, 1998 (63 FR 64132). Screening values of common radionuclides for surface soil contamination were published in the **Federal Register** on December 7, 1999 (64 FR 68395). As discussed in these notices, NRC's DandD computer code provides a method for calculating screening values for radionuclides in soil, and screening values for contamination on building surfaces. NRC used the DandD methodology to derive the building surface contamination screening values in Table 1 of the November 18, 1998, notice and the surface soil contamination screening values in Table 3 of the December 7, 1999, notice. These screening values correspond to levels of radionuclide contamination that would be deemed in compliance with the unrestricted use dose limit in 10 CFR 20.1402 (*i.e.*, 0.25 milliSievert/year, (25 millirem/year)). The values correspond to screening "derived concentration guidelines" (DCGLs) for each specific radionuclide based on the methodology described in NRC's draft Regulatory Guide "Demonstrating Compliance with the Radiological Criteria for License Termination" (DG-4006). After these screening values were published, several questions arose concerning conditions or criteria under which the screening values would apply. Criteria for determining the applicability of these screening values is provided in the following section.

SUPPLEMENTARY INFORMATION: Sites with surface soil contamination levels below those listed in Table 3 of the December

7, 1999, notice will be deemed acceptable for release for unrestricted use provided that:

1. Residual radioactivity has been reduced to levels that are "as low as is reasonably achievable" (ALARA);
2. The residual radioactivity is contained in the top layer of the surface soil (*i.e.*, a thickness of approximately 15 centimeters);
3. The unsaturated zone and the groundwater are initially free of radiological contamination; and
4. The vertical saturated hydraulic conductivity at the specific site is greater than the infiltration rate. (Refer to NUREG/CR-5512, Vol. 1, "Residual Radioactive Contamination from Decommissioning, Technical Basis for Translating Contamination Levels to Annual Total Effective Dose Equivalent, Final Report, October 1992" for additional information.) Buildings with surface contamination levels below those listed in Table 1 of the November 18, 1998, notice will be deemed acceptable for release for unrestricted use provided that:

1. Residual radioactivity has been reduced to levels that are ALARA;
2. The residual radioactivity is contained in the top layer of the building surface (*i.e.*, there is no volumetric contamination);
3. The fraction of removable surface contamination does not exceed 0.1. (For cases when the fraction of removable contamination is undetermined or higher than 0.1, users may assume, for screening purposes, that 100 percent of the surface contamination is removable, and therefore the screening values should be decreased by a factor of 10.)

For radionuclides not listed in the Tables 1 and 3, the latest version of the DandD code may be used, without modification of the default values, to derive screening values. However, because the current version of DandD (*i.e.*, version 1) is overly conservative, and DandD version 2 is under development, NUREG/CR-5512, Vol. 3, "Residual Radioactive Contamination From Decommissioning, Parameter Analysis, Draft Report for Comment, October 1999," may be used to determine acceptable screening values. Specifically, Table 5.19 (using a $P_{crit} = 0.90$) may be used for building surface contamination screening values and Table 6.91 (using a $P_{crit} = 0.10$) may be used for surface soil screening values.

For site-specific analyses, licensees may use models other than DandD to demonstrate compliance with the LTR provided they can demonstrate that the model and parameters used in that model are appropriate for the site.

For mixtures of radionuclides in soil or on building surfaces, the "sum of fractions" rule applies (see 10 CFR Part 20, Appendix B, Note 4).

The NRC staff intends to include Tables 1 and 3 and these criteria governing their use in the Standard Review Plan for decommissioning. Comments on this approach may be submitted within 30 days from the date of this notice to the Rules and Directives Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

For further information: Contact Dr. Rateb (Boby) Abu-Eid, Environmental and Performance Assessment Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Telephone: (301) 415-5811; fax: (301) 415-5398; or email: bae@nrc.gov.

Dated at Rockville, Maryland, this 7th day of June 2000.

For the Nuclear Regulatory Commission.

Robert A. Nelson,

*Acting Chief, Decommissioning Branch,
Division of Waste Management, Office of
Nuclear Material, Safety and Safeguards.*

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NUCLEAR REGULATORY COMMISSION

Office of Nuclear Material Safety and Safeguards Spent Fuel Project Office; Notice of Issuance and Availability of NUREG/CR-6672 Reexamination of Spent Fuel Shipment Risk Estimates

The United States Nuclear Regulatory Commission (NRC) has issued the final report "Reexamination of Spent Fuel Shipment Risk Estimates," NUREG/CR-6672, SAND2000-0234.

The Reexamination evaluates the risks associated with anticipated truck and rail transport of spent fuel under both routine and accident conditions, and concludes that these risks are small. The report was prepared for the Spent Fuel Project Office (SFPO) by Sandia National Laboratories (SNL).

NUREG/CR-6672 is intended for use by risk analysts, scientists, and engineers. A peer review of NUREG/CR-6672 was conducted by Lawrence Livermore National Laboratories, and is available for public review in NRC Agencywide Documents Access and Management System by searching Accession Number ML003720331.

NUREG/CR-6672 is available for inspection, and copying for a fee, at the NRC Public Document Room, 2120 L



REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 1.86

TERMINATION OF OPERATING LICENSES FOR NUCLEAR REACTORS

A. INTRODUCTION

Section 50.51, "Duration of license, renewal," of 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires that each license to operate a production and utilization facility be issued for a specified duration. Upon expiration of the specified period, the license may be either renewed or terminated by the Commission. Section 50.82, "Applications for termination of licenses," specifies the requirements that must be satisfied to terminate an operating license, including the requirement that the dismantlement of the facility and disposal of the component parts not be inimical to the common defense and security or to the health and safety of the public. This guide describes methods and procedures considered acceptable by the Regulatory staff for the termination of operating licenses for nuclear reactors. The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

B. DISCUSSION

When a licensee decides to terminate his nuclear reactor operating license, he may, as a first step in the process, request that his operating license be amended to restrict him to possess but not operate the facility. The advantage to the licensee of converting to such a possession-only license is reduced surveillance requirements in that periodic surveillance of equipment important to the safety of reactor operation is no longer required. Once this possession-only license is issued, reactor operation is not permitted. Other activities related to cessation of operations such as unloading fuel from the reactor and placing it in storage (either onsite or offsite) may be continued.

A licensee having a possession-only license must retain, with the Part 50 license, authorization for special nuclear material (10 CFR Part 70, "Special Nuclear Material"), byproduct material (10 CFR Part 30, "Rules of General Applicability to Licensing of Byproduct Material"), and source material (10 CFR Part 40, "Licensing of Source Material"), until the fuel, radioactive components, and sources are removed from the facility. Appropriate administrative controls and facility requirements are imposed by the Part 50 license and the technical specifications to assure that proper surveillance is performed and that the reactor facility is maintained in a safe condition and not operated.

A possession-only license permits various options and procedures for decommissioning, such as mothballing, entombment, or dismantling. The requirements imposed depend on the option selected.

Section 50.82 provides that the licensee may dismantle and dispose of the component parts of a nuclear reactor in accordance with existing regulations. For research reactors and critical facilities, this has usually meant the disassembly of a reactor and its shipment offsite, sometimes to another appropriately licensed organization for further use. The site from which a reactor has been removed must be decontaminated, as necessary, and inspected by the Commission to determine whether unrestricted access can be approved. In the case of nuclear power reactors, dismantling has usually been accomplished by shipping fuel offsite, making the reactor inoperable, and disposing of some of the radioactive components.

Radioactive components may be either shipped off-site for burial at an authorized burial ground or secured

USAEC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the AEC Regulatory staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Published guides will be revised periodically, as appropriate, to accommodate comments and to reflect new information or experience.

Copies of published guides may be obtained by request indicating the divisions desired to the U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Director of Regulatory Standards. Comments and suggestions for improvements in these guides are encouraged and should be sent to the Secretary of the Commission, U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Chief, Public Proceedings Staff.

The guides are issued in the following ten broad divisions:

1. Power Reactors
2. Research and Test Reactors
3. Fuels and Materials Facilities
4. Environmental and Siting
5. Materials and Plant Protection
6. Products
7. Transportation
8. Occupational Health
9. Antitrust Review
10. General

on the site. Those radioactive materials remaining on the site must be isolated from the public by physical barriers or other means to prevent public access to hazardous levels of radiation. Surveillance is necessary to assure the long term integrity of the barriers. The amount of surveillance required depends upon (1) the potential hazard to the health and safety of the public from radioactive material remaining on the site and (2) the integrity of the physical barriers. Before areas may be released for unrestricted use, they must have been decontaminated or the radioactivity must have decayed to less than prescribed limits (Table I).

The hazard associated with the retired facility is evaluated by considering the amount and type of remaining contamination, the degree of confinement of the remaining radioactive materials, the physical security provided by the confinement, the susceptibility to release of radiation as a result of natural phenomena, and the duration of required surveillance.

C. REGULATORY POSITION

1. APPLICATION FOR A LICENSE TO POSSESS BUT NOT OPERATE (POSSESSION-ONLY LICENSE)

A request to amend an operating license to a possession-only license should be made to the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545. The request should include the following information:

- a. A description of the current status of the facility.
- b. A description of measures that will be taken to prevent criticality or reactivity changes and to minimize releases of radioactivity from the facility.
- c. Any proposed changes to the technical specifications that reflect the possession-only facility status and the necessary disassembly/retirement activities to be performed.
- d. A safety analysis of both the activities to be accomplished and the proposed changes to the technical specifications.
- e. An inventory of activated materials and their location in the facility.

2. ALTERNATIVES FOR REACTOR RETIREMENT

Four alternatives for retirement of nuclear reactor facilities are considered acceptable by the Regulatory staff. These are:

a. **Mothballing.** Mothballing of a nuclear reactor facility consists of putting the facility in a state of protective storage. In general, the facility may be left intact except that all fuel assemblies and the radioactive

fluids and waste should be removed from the site. Adequate radiation monitoring, environmental surveillance, and appropriate security procedures should be established under a possession-only license to ensure that the health and safety of the public is not endangered.

b. **In-Place Entombment.** In-place entombment consists of sealing all the remaining highly radioactive or contaminated components (e.g., the pressure vessel and reactor internals) within a structure integral with the biological shield after having all fuel assemblies, radioactive fluids and wastes, and certain selected components shipped offsite. The structure should provide integrity over the period of time in which significant quantities (greater than Table I levels) of radioactivity remain with the material in the entombment. An appropriate and continuing surveillance program should be established under a possession-only license.

c. **Removal of Radioactive Components and Dismantling.** All fuel assemblies, radioactive fluids and waste, and other materials having activities above accepted unrestricted activity levels (Table I) should be removed from the site. The facility owner may then have unrestricted use of the site with no requirement for a license. If the facility owner so desires, the remainder of the reactor facility may be dismantled and all vestiges removed and disposed of.

d. **Conversion to a New Nuclear System or a Fossil Fuel System.** This alternative, which applies only to nuclear power plants, utilizes the existing turbine system with a new steam supply system. The original nuclear steam supply system should be separated from the electric generating system and disposed of in accordance with one of the previous three retirement alternatives.

3. SURVEILLANCE AND SECURITY FOR THE RETIREMENT ALTERNATIVES WHOSE FINAL STATUS REQUIRES A POSSESSION-ONLY LICENSE

A facility which has been licensed under a possession-only license may contain a significant amount of radioactivity in the form of activated and contaminated hardware and structural materials. Surveillance and commensurate security should be provided to assure that the public health and safety are not endangered.

a. Physical security to prevent inadvertent exposure of personnel should be provided by multiple locked barriers. The presence of these barriers should make it extremely difficult for an unauthorized person to gain access to areas where radiation or contamination levels exceed those specified in Regulatory Position C.4. To prevent inadvertent exposure, radiation areas above 5 mR/hr, such as near the activated primary system of a power plant, should be appropriately marked and should not be accessible except by cutting of welded closures or the disassembly and removal of substantial structures

and/or shielding material. Means such as a remote-readout intrusion alarm system should be provided to indicate to designated personnel when a physical barrier is penetrated. Security personnel that provide access control to the facility may be used instead of the physical barriers and the intrusion alarm systems.

b. The physical barriers to unauthorized entrance into the facility, e.g., fences, buildings, welded doors, and access openings, should be inspected at least quarterly to assure that these barriers have not deteriorated and that locks and locking apparatus are intact.

c. A facility radiation survey should be performed at least quarterly to verify that no radioactive material is escaping or being transported through the containment barriers in the facility. Sampling should be done along the most probable path by which radioactive material such as that stored in the inner containment regions could be transported to the outer regions of the facility and ultimately to the environs.

d. An environmental radiation survey should be performed at least semiannually to verify that no significant amounts of radiation have been released to the environment from the facility. Samples such as soil, vegetation, and water should be taken at locations for which statistical data has been established during reactor operations.

e. A site representative should be designated to be responsible for controlling authorized access into and movement within the facility.

f. Administrative procedures should be established for the notification and reporting of abnormal occurrences such as (1) the entrance of an unauthorized person or persons into the facility and (2) a significant change in the radiation or contamination levels in the facility or the offsite environment.

g. The following reports should be made:

(1) An annual report to the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545, describing the results of the environmental and facility radiation surveys, the status of the facility, and an evaluation of the performance of security and surveillance measures.

(2) An abnormal occurrence report to the Regulatory Operations Regional Office by telephone within 24 hours of discovery of an abnormal occurrence. The abnormal occurrence will also be reported in the annual report described in the preceding item.

h. Records or logs relative to the following items should be kept and retained until the license is terminated, after which they may be stored with other plant records:

- (1) Environmental surveys;
- (2) Facility radiation surveys,
- (3) Inspections of the physical barriers, and
- (4) Abnormal occurrences.

4. DECONTAMINATION FOR RELEASE FOR UNRESTRICTED USE

If it is desired to terminate a license and to eliminate any further surveillance requirements, the facility should be sufficiently decontaminated to prevent risk to the public health and safety. After the decontamination is satisfactorily accomplished and the site inspected by the Commission, the Commission may authorize the license to be terminated and the facility abandoned or released for unrestricted use. The licensee should perform the decontamination using the following guidelines:

a. The licensee should make a reasonable effort to eliminate residual contamination.

b. No covering should be applied to radioactive surfaces of equipment or structures by paint, plating, or other covering material until it is known that contamination levels (determined by a survey and documented) are below the limits specified in Table I. In addition, a reasonable effort should be made (and documented) to further minimize contamination prior to any such covering.

c. The radioactivity of the interior surfaces of pipes, drain lines, or ductwork should be determined by making measurements at all traps and other appropriate access points, provided contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement should be assumed to be contaminated in excess of the permissible radiation limits.

d. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated in excess of the limits specified. This may include, but is not limited to, special circumstances such as the transfer of premises to another licensed organization that will continue to work with radioactive materials. Requests for such authorization should provide:

(1) Detailed, specific information describing the premises, equipment, scrap, and radioactive contaminants and the nature, extent, and degree of residual surface contamination.

(2) A detailed health and safety analysis indicating that the residual amounts of materials on surface areas, together with other considerations such as the prospective use of the premises, equipment, or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

e. Prior to release of the premises for unrestricted use, the licensee should make a comprehensive radiation survey establishing that contamination is within the limits specified in Table I. A survey report should be filed with the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545, with a copy to the Director of the Regulatory Operations Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report should:

(1) Identify the premises;

(2) Show that reasonable effort has been made to reduce residual contamination to as low as practicable levels;

(3) Describe the scope of the survey and the general procedures followed; and

(4) State the finding of the survey in units specified in Table I.

After review of the report, the Commission may inspect the facilities to confirm the survey prior to granting approval for abandonment.

5. REACTOR RETIREMENT PROCEDURES

As indicated in Regulatory Position C.2, several alternatives are acceptable for reactor facility retirement. If minor disassembly or "mothballing" is planned, this could be done by the existing operating and maintenance procedures under the license in effect. Any planned actions involving an unreviewed safety question

or a change in the technical specifications should be reviewed and approved in accordance with the requirements of 10 CFR §50.59.

If major structural changes to radioactive components of the facility are planned, such as removal of the pressure vessel or major components of the primary system, a dismantlement plan including the information required by §50.82 should be submitted to the Commission. A dismantlement plan should be submitted for all the alternatives of Regulatory Position C.2 except mothballing. However, minor disassembly activities may still be performed in the absence of such a plan, provided they are permitted by existing operating and maintenance procedures. A dismantlement plan should include the following:

a. A description of the ultimate status of the facility

b. A description of the dismantling activities and the precautions to be taken.

c. A safety analysis of the dismantling activities including any effluents which may be released.

d. A safety analysis of the facility in its ultimate status.

Upon satisfactory review and approval of the dismantling plan, a dismantling order is issued by the Commission in accordance with §50.82. When dismantling is completed and the Commission has been notified by letter, the appropriate Regulatory Operations Regional Office inspects the facility and verifies completion in accordance with the dismantlement plan. If residual radiation levels do not exceed the values in Table I, the Commission may terminate the license. If these levels are exceeded, the licensee retains the possession-only license under which the dismantling activities have been conducted or, as an alternative, may make application to the State (if an Agreement State) for a byproduct materials license.

TABLE I
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDE ^a	AVERAGE ^{b c}	MAXIMUM ^{b d}	REMOVABLE ^{b e}
U-nat, U-235, U-238, and associated decay products	5,000 dpm α /100 cm ²	15,000 dpm α /100 cm ²	1,000 dpm α /100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm ²	3000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm β - γ /100 cm ²	15,000 dpm β - γ /100 cm ²	1000 dpm β - γ /100 cm ²

^aWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^bAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^cMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

^dThe maximum contamination level applies to an area of not more than 100 cm².

^eThe amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.