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**RADIOLOGIC HEALTH BRANCH**  
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## POLICY MEMORANDUM

Radiologic Health Branch

Policy No. RML-00-02

Effective Date of Policy: May 1, 2000  
Supersedes Policy No.: IPM-88-2 (with respect to *Large-Scale Decommissioning Projects*)

### RADIOLOGICAL RELEASE CRITERIA FOR FACILITIES UNDERGOING LARGE-SCALE DECOMMISSIONING

#### 1.0 SCOPE

This memorandum establishes a policy for: 1) establishing radiological release criteria and 2) determining compliance with release criteria for facilities deemed to be *Large-Scale Decommissioning Projects*, as defined in RML-00-01.

#### 2.0 AUTHORITY AND REFERENCE

The California Code of Regulations (CCR), title 17, section 30256 requires that certain specific licensees provide a decommissioning plan (hereinafter *Site Decommissioning Plan*) if the procedures needed to carry out decommissioning activities have not been previously approved by the Department of Health Services, Radiologic Health Branch (the Branch) and could increase potential health and safety impacts to workers or the public. Procedures with potential health and safety impacts may not be carried out without the Branch's prior approval of the decommissioning plan. Radiological release criteria and methods to demonstrate compliance with radiological release criteria are addressed in the *Site Decommissioning Plan*.

#### 3.0 BACKGROUND

This section provides background information on current California regulations on radiological release criteria; the U.S. Nuclear Regulatory Commission's (NRC's) regulations on radiological criteria for license termination; NRC's guidance documents regarding demonstration of compliance with the regulations on radiological criteria for

license termination; and NRC's Directive 5.9 regarding compatibility of Agreement State programs with NRC's regulatory program.

### 3.1 CALIFORNIA CODE OF REGULATIONS (CCR), TITLE 17, SECTION 30256

The California Code of Regulations (CCR), title 17, section 30256 provides requirements for certain specific licensees that are requesting authorization to have their sites released for unrestricted use by the Branch. CCR, title 17, section 30256(c)(5) requires that the licensee conducts a radiation survey of the premises where licensed activities were conducted, and that a survey report be submitted to the Branch. No release criteria, however, are provided in CCR, title 17, and section 30256.

In addition to the above, CCR, title 17, section 30256(d) requires that the licensee submit a *Site Decommissioning Plan*, if the procedures needed to carry out decommissioning activities have not been previously approved by the Branch and could increase potential health and safety impacts to workers or the public. CCR, title 17, section 30256(g) specifies that the Branch will approve the *Site Decommissioning Plan* if the Branch determines that the decommissioning project will be completed in a reasonable time period and that the health and safety of the workers and the public will be adequately protected. Again, however, no release criteria are provided.

The Branch's Policy No. IPM-88-2 provides a procedure to verify that a facility has been decontaminated to acceptable levels. The policy provides a table (known as the DECON-1 table) of acceptable surface contamination levels for various radionuclides. Pursuant to the policy, an inspector is to determine that the residual activity is less than those provided in the table or alternatively that the contamination present in the facility or environs does not pose a radiation hazard to the public. No release criteria are provided for equipment, soil, water, or volumetrically contaminated materials.

Surface contamination levels presented in the DECON-1 table are identical (limits for I-125 excepted) to levels presented in NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release to Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," August 1987. The NRC limits apply to NRC Part 30 licensees (Byproduct Materials licensees). The NRC limits for Byproduct Materials licensees are identical to those presented in the NRC's Regulatory Guide 1.86, which was developed for NRC's Part 50 licensees (Production and Utilization Facilities). Regulatory Guide 1.86 also recommended that the licensee make a reasonable effort to eliminate residual contamination.

### 3.2 NRC'S REGULATIONS ON RADIOLOGICAL CRITERIA FOR LICENSE TERMINATION

The NRC amended its regulations to establish explicit dose-based radiological criteria for decommissioning of licensed nuclear facilities. The new regulations applicable to byproduct material are provided in 10 CFR 20 Subpart E, "Radiological Criteria for

License Termination." The new regulations applicable to source material are provided in 10 CFR 40, section 42, "Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas," referencing 10 CFR 20 Subpart E. Radiological criteria for unrestricted use are 1) that the residual radioactivity that is distinguishable from background results in a Total Effective Dose Equivalent (TEDE) to an average member of the critical group that does not exceed 25 mrem per year, including that from groundwater sources of drinking water, and 2) that the residual radioactivity has been reduced to levels that are ALARA. Under 10 CFR 20, Subpart E, the licensee is required to determine the peak annual TEDE expected to occur within the first 1000 years after decommissioning. Radiological criteria for restricted use and alternative criteria for license termination are also provided in Subpart E. The NRC's regulations on radiological criteria for license termination, in 10 CFR 20, Subpart E, and 10 CFR 40, section 42 replace prior NRC guidance on surface and volume activity limits for specific radionuclides. Release of equipment is not covered by the NRC's regulations on radiological criteria for license termination.

The NRC's effective date of the regulations on radiological criteria for license termination is August 20, 1997. A "grandfathering period," from August 20, 1997 to August 20, 1998, was implemented by NRC.

### **3.3 NRC GUIDANCE REGARDING COMPLIANCE WITH THE REGULATIONS ON RADIOLOGICAL CRITERIA FOR LICENSE TERMINATION.**

NRC has issued NUREG Report 1575, pre-published NUREG Reports 1505 and 1507, Draft Report for Comment NUREG 1549, and Draft Regulatory Guide DG-4006 to assist licensees and license reviewers with implementing the regulations on radiological criteria for license termination, in 10 CFR 20, Subpart E, and 10 CFR 40, section 42.

### **3.4 NRC MANAGEMENT DIRECTIVE 5.9**

NRC evaluates Agreement State programs established pursuant to Section 274 of the Atomic Energy Act of 1954, as amended, to ensure that the programs are adequate to protect public health and safety and are compatible with NRC's regulatory program. NRC has designated the regulations on radiological criteria for license termination, in 10 CFR 20, Subpart E, and 10 CFR 40, section 42 as Category C program elements, in

accordance with NRC Management Directive 5.9. Since the NRC has determined that Agreement States should adopt these regulations for purposes of compatibility, they should be adopted not later than 3 years after the NRC's effective date of the regulations, in accordance with NRC Management Directive 5.9. Thus, Agreement States should adopt these regulations by August 20, 2001.

The Branch implemented the 25 millirem per year criteria, effective August 20, 1998, for facilities that had not submitted a *Site Decommissioning Plan* prior to that date. A modified version of NRC's regulations on radiological criteria for license termination is slated for incorporation into CCR, title 17, and section 30253. An important modification of the NRC's regulations have been made in the proposed adoption into CCR, title 17, section 30253. The modification effects the incorporation of 10 CFR 20.1405, which concerns public notification and public participation in license termination or decommissioning plans. Radiological criteria for release of facilities will be incorporated by reference into CCR, title 17 without change. The expected date of incorporation of NRC's regulations on radiological criteria for license termination into CCR, title 17 is July 2000.

#### 4.0 POLICY

It shall be the policy of the Branch that:

- 4.1 Facilities designated as *Large-Scale Decommissioning Projects*, who submit a *Site Decommissioning Plan*, as discussed in Policy No. RML-00-01, after August 20, 1998, shall ensure 1) that the residual radioactivity that is distinguishable from background results in a Total Effective Dose Equivalent (TEDE) to an average member of the critical group that does not exceed 25 mrem per year, including that from groundwater sources of drinking water, and 2) that the residual radioactivity has been reduced to levels that are ALARA.
- 4.2 In addition, facilities designated as *Large-Scale Decommissioning Projects*, who submit a *Site Decommissioning Plan*, as discussed in Policy No. RML-00-01, after the date of the amendments to CCR, title 17, section 30253, incorporating 10 CFR 20, sections 1401, 1402, 1403, and 1404, shall meet the requirements of the amendments, as of the effective date of these amendments.
- 4.3 These requirements shall apply to all licensable material possessed or used in California, including accelerator-produced radioactive material; technologically-enhanced, naturally-occurring radioactive material; materials made radioactive by exposure to neutrons; byproduct material; source material; and special nuclear material, except as discussed in sections 4.4, 4.5, and 4.6 below.

- 4.4** For those facilities possessing radium with or without its progeny, the Branch may consider, on a case-by-case basis, alternative decommissioning criteria, with respect to the radium and its progeny (if present) only.
- 4.5** For uranium and thorium recovery facilities, or other similar facilities, as determined on a case-by-case basis by the Branch, the Branch may consider alternative decommissioning criteria in accordance with NRC regulations in 10 CFR 40, Appendix A.
- 4.6** With respect to potassium, facilities need only address potassium-40 in their *Site Decommissioning Plan*, where potassium or potassium compounds has been isotopically enriched in potassium-40.
- 4.7** Facilities shall demonstrate compliance with the above in the following manner:
- 4.7.1** For release of buildings and soil, methods consistent with those described in NRC Draft Regulatory Guide DG-4006 and associated NRC NUREG Reports shall be used.
- 4.7.2** For release of building surfaces and contaminated surface soil, methods consistent with those described in NRC NUREG Report 1575 (MARSSIM) shall be used.
- Note: MARSSIM does not cover construction materials, equipment, subsurface soil, surface or subsurface water, biota, air, sewers, sediments, or volumetric contamination.
- 4.7.3** For equipment reuse or volumetrically contaminated scrap materials, methods consistent with NRC NUREG Report 1640 shall be used.
- 4.7.4** For construction materials, subsurface soil, surface or subsurface water, biota, air, sewers, and sediments, methods deemed acceptable by the Branch on a case-by-case basis shall be used.
- 4.7.5** By alternative methods deemed acceptable by the Branch on a case-by-case basis.

## 5.0 REFERENCES

American National Standards Institute report "Surface and Volume Radioactivity Standards for Unconditional Clearance," ANSI N13.12-1997.

California Code of Regulations (CCR) title 17, August 1999.

California Radiologic Health Branch Policy No. IPM-88-2, "Clearance Inspection and Survey," December 1, 1997.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment," January 7, 1993.

U. S. Nuclear Regulatory Commission, "Draft NMSS Decommissioning Standard Review Plan," July 12, 1999.

U.S. Nuclear Regulatory Commission, Draft Regulatory Guide, DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination," August 1998.

U. S. Nuclear Regulatory Commission, "Guidelines for Decontamination of Facilities and Equipment Prior to Release to Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," August 1987.

U. S. Nuclear Regulatory Commission, Management Directive 5.9, "Adequacy and Compatibility of Agreement State Programs," approved February 27, 1998.

U.S. Nuclear Regulatory Commission, NUREG Report 1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys."

U.S. Nuclear Regulatory Commission, NUREG Report 1506, "Measurement Methods for Radiological Surveys in Support of New Decommissioning Criteria," August 1995.

U.S. Nuclear Regulatory Commission, NUREG Report 1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions," December 1997.

U.S. Nuclear Regulatory Commission, NUREG Report 1549, "Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination," Draft Report for Comment, July 1998.

U.S. Nuclear Regulatory Commission, NUREG Report 1575/EPA 402-R-97-016, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," December 1997.

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U.S. Nuclear Regulatory Commission, NUREG Report 1640, "Radiological Assessments for Clearance of Equipment and Materials for Nuclear Facilities," December 1998.

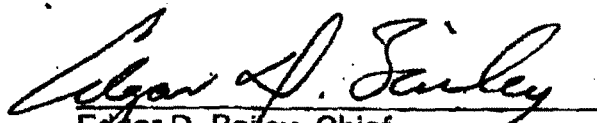
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U.S. Nuclear Regulatory Commission, NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination," Draft Report for Comment, June 1992.

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors," June 1974.

U.S. Nuclear Regulatory Commission, Regulatory Guide 3.65, "Standard Format and Content of Decommissioning Plans for Licensees Under 10 CFR Parts 30, 40, and 70," August 1989.

U. S. Nuclear Regulatory Commission, "Supplemental Information on the Implementation of the Final Rule on Radiological Criteria for License Termination," Federal Register Volume 63, No. 222, November 18, 1998.

  
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