[7590-01-P]

U.S. 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:

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 VALUES[2] (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

[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.

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

[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.

FOR FURTHER INFORMATION:

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.
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[original signed by:]

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Rules and Directives Branch
Division of Administrative Services
Office of Administration

FROM: Larry Camper, Chief
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUPPLEMENTAL INFORMATION ON THE IMPLEMENTATION OF THE RADIOLOGICAL CRITERIA FOR LICENSE TERMINATION

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CONTACT: B. Eid, NMSS
415-5811

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