

Nuclear Regulatory Commission

10 CFR Part 51

[Docket No. PRM-51-1]

New England Coalition on Nuclear Pollution; Denial of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Denial of petition for rulemaking.

SUMMARY: The Nuclear Regulatory Commission (NRC) is denying a petition for rulemaking (PRM-51-1) submitted by the New England Coalition on Nuclear Pollution (now New England Coalition (NEC)). The petitioner requested that the NRC revise the value for radon-222 in Table S-3, "Table of Uranium Fuel Cycle Environmental Data," of 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," because it did not disclose the long-term and long-range health effects of radon gas released from uranium mill tailings piles.

ADDRESSES: For a copy of the petition, write to Michael T. Lesar, Chief, Rulemaking, Directives, and Editing Branch, Division of Administrative Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-7163; e-mail: MTL@nrc.gov.

Publicly available documents related to this petition may be viewed electronically on public computers in the NRC's public document Room (PDR), O-1 F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The PDR reproduction contractor will copy documents for a fee.

Publicly available documents created or received at the NRC after November 1, 1999, are also available electronically at the NRC's Electronic Reading Room at

<http://www.nrc.gov/NRC/ADAMS/index.html>. From this site, the public can gain entry into the NRC's Agencywide document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS contact the NRC's PDR Reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr@nrc.gov.

FOR FURTHER INFORMATION CONTACT: Stewart Schneider, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-4123; e-mail SXS4@nrc.gov.

SUPPLEMENTARY INFORMATION:

Background

On November 25, 1975, the NRC docketed a petition for rulemaking (PRM-51-1) dated November 19, 1975, filed by Roisman, Kessler, and Cashdan, on behalf of the New England Coalition on Nuclear Pollution, now New England Coalition (NEC). The petitioner requested the Commission to issue a number of amendments to 10 CFR Part 51, Table S-3, "Table of Uranium Fuel Cycle Environmental Data," and to postpone resolution of pending applications for construction or operation of nuclear power plants and to reassess the conclusions for previous authorizations for construction or operation of nuclear power plants. Table S-3 lists environmental data to be used by applicants and the NRC staff as the basis for evaluating the environmental effects of the portions of the fuel cycle that occur before new fuel is delivered to the plant and after spent fuel is removed from the plant site for light-water reactors (LWRs).

The petitioner stated that:

1. Table S-3 "seriously understates" the impact on human safety and health by disregarding the long-term effects of certain long-lived radionuclides and that the health effects of uranium mining and milling listed in the table fail to disclose the long-term and long-range health effects of radon-222 released from tailings piles;

2. The health effects of krypton-85 and tritium releases from fuel reprocessing plants are underestimated in Table S-3;

3. Releases of carbon-14 from the fuel cycle should be included in Table S-3;

4. Table S-3, by the exclusive use of the term "man-rems," does not provide a meaningful representation of these health effects, and that human deaths from man-rem exposures provide a more easily comprehended consequence of the fuel cycle activities; and

5. The magnitude of the potential death toll from mill tailings alone is so great as to alter the previous judgment on these matters and to require, as a minimum, a reassessment of previous conclusions to authorize construction and operation of nuclear reactors and a postponement of resolution of all pending applications for construction or operation authority until final resolution of this issue by the Commission.

The NRC published a notice of receipt of petition on January 16, 1976 (41 FR 2448). The notice of receipt invited interested persons to submit written comments on the petition. Comments were received from 10 organizations. The Commission resolved the public comments as discussed in a Federal Register notice published on April 14, 1978 (43 FR 15613).

Response to the Petition

In its April 14, 1978 notice, the Commission resolved the petitioner's first issue (concerning the value for radon-222 in Table S-3), in part, when it amended Table S-3 by deleting the value for radon-222.¹ The Commission, however, deferred instituting any rulemaking on the radon issue, including the insertion of a revised value for radon-222, pending generic consideration of the issue. The generic consideration of the radon-222 value in Table S-3 remained the one outstanding item of this petition and is now resolved by this denial, as explained under the "Reasons for Denial" section below.

As reflected in the April 14, 1978 notice, the Commission resolved the second and third issues raised by the petition when the Commission published a revised Table S-3 on March 14, 1977 (42 FR 13803). In this revision, the Commission added carbon-14 to the table and revised the release values for krypton-85 and tritium upwards. Differences in the petitioner's release estimates and those of the NRC staff were due to differences in the models used. The basis for the NRC models is described in detail in NUREG-0116, "Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle," October 1976, and NUREG-0216, "Public Comments and Task Force Responses Regarding the Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle," March 1977.

As further reflected in the April 14, 1978 notice, the Commission resolved the petitioner's fourth issue, namely, that Table S-3 does not provide a meaningful representation of health effects, by amending Footnote 1 to Table S-3 to indicate that health effects are not covered in the table and may be litigated in individual cases.

¹ The original radon-222 value in Table S-3 was 75 curies followed by the statement, "Principally from mills—maximum annual dose rate <4 percent of average natural background within 5 mi of mill. Results in 0.06 man-rem per annual fuel requirement."

Finally, regarding the petitioner's fifth issue, the Commission in the April 14, 1978 notice, denied the petitioner's request to halt the licensing of reactors and to reopen all proceedings where construction or operation had already been authorized. The Commission concluded that the actions it had taken (as described previously) effectively addressed the concerns raised by the petitioner.

Reasons for Denial

The NRC is denying the remaining outstanding issue from the petition for rulemaking (PRM-51-1) submitted by the New England Coalition on Nuclear Pollution (now New England Coalition or NEC), namely, the revision of the value for radon-222 in Table S-3.

The update to Table S-3 was delayed because, by the mid-1980s, there were no new applications for construction of nuclear power plants, nor, at that time, were any future ones predicted. Consequently, there was no regulatory need to update Table S-3 and competing priorities for rulemaking resources eventually resulted in the cessation of activities on the table. Since the mid-1980s, the NRC has revisited the issue of revising the value for radon-222 in Table S-3 on more than one occasion, but in each case higher priority rulemakings led to a halt in these efforts.

The NRC is denying the remaining outstanding issue in PRM-51-1, revising the value for radon-222 in Table S-3 of 10 CFR Part 51, because the NRC has made a generic determination that the radiological impacts of the uranium fuel cycle, including those from radon-222 emissions, on individuals off-site will remain at or below the Commission's regulatory limits, and as such, are of small significance. The NRC described this generic determination and conclusion in chapter 6 of the Generic Impact Statement for License Renewal of Nuclear Plants,

NUREG-1437, May 1996, (NUREG-1437),² which was in turn, based upon the findings made in NRC and Environmental Protection Agency (EPA) rulemakings as described below.

EPA and NRC Regulatory Programs

Section 84a(2) of the Atomic Energy Act (AEA) requires NRC to conform its regulations to EPA's regulations promulgated under the Uranium Mill Tailings Radiation Control Act, 42 U.S.C. §§ 2022, 7901-7942 (UMTRCA) for the protection of the public health, safety and the environment from radiological and non-radiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material as defined under section 11(e)(2) of the AEA, e.g., uranium mill tailings. EPA's regulations at Subpart D of 40 CFR Part 192 set forth a design standard requiring that the tailings or wastes from mill operations be covered to provide reasonable assurance that radon released to the atmosphere from the tailings or wastes will not exceed an average of 20 picocuries per square meter per second (pCi/m²-s) flux for 1000 years, to the extent reasonably achievable, and in any case, for 200 years.³ In 1985, the NRC conformed its regulations at 10 CFR Part 40, Appendix A, to EPA's regulations at Subpart D of 40 CFR Part 192, by adopting the 20 pCi/m²-s flux standard.⁴ The NRC regulations at 10 CFR Part 40, Appendix A apply to NRC or Agreement State licensed mill tailings piles.

An EPA risk assessment conducted as part of the 1989 EPA National Emission Standard for Hazardous Air Pollutants rulemaking (promulgating 40 CFR Part 61, Subparts T and W), consisting of a two-step analysis, established that compliance with the 20 pCi/m²-s flux standard for radon emissions from uranium mill tailings piles would result in an estimated

² NUREG-1437, Ch. 6., § 6.2.2.1 (pp. 6-8 to 6-18), § 6.2.4 (pp. 6-27 to 6-28), and § 6.6 (pp. 6-87 to 6-88).

³ 40 CFR 192.32(b); see also 48 FR 45926 (October 7, 1983).

⁴ 50 FR 41852 (October 16, 1985).

lifetime risk of cancer to the maximally exposed individual of approximately 1E-4, a level determined by EPA to be safe, under the first step of the analysis, and provided an ample margin of safety under the second step, which considered additional factors such as cost and technological feasibility.⁵

On June 1, 1994, the NRC published a final rule which conformed its regulations at 10 CFR Part 40, Appendix A, to amendments made by EPA in 1993 to Subpart D of 40 CFR Part 192.⁶ The EPA amendments and the conforming NRC rule added provisions to fill a regulatory gap related to the timing and monitoring of NRC or Agreement State licensed mill tailings piles. In a related July 15, 1994 rulemaking, EPA found that the NRC regulatory program concerning radon-222 emissions from these tailings piles “protect public health with an ample margin of safety” and that the “NRC’s implementation criteria set forth a rigorous program governing the reclamation of the disposal sites so that closure will (1) last for 1,000 years to the extent reasonable, but in any event at least 200 years, and (2) limit radon release to 20 pCi/m²-s throughout that period.”⁷

NUREG-1437

In 1996, the NRC incorporated the above EPA regulatory findings and NRC standards reflected in 10 CFR Part 40, Appendix A into NUREG-1437. Specifically, the NRC “supplements the data on environmental impacts of the uranium fuel cycle presented in Table

⁵ 54 FR 51654, 51682-83 (December 15, 1989); *see also* 59 FR 36280, 36281, 36287-88 (July 15, 1994).

⁶ 59 FR 28220 (June 1, 1994). The EPA final rule amending 40 CFR Part 192, Subpart D was published on November 15, 1993 (58 FR 60340).

⁷ 59 FR 36280, 36283 (July 15, 1994).

S-3 . . . to extend the coverage of impacts to ^{222}Rn , ^{99}Tc , higher fuel enrichment, higher fuel burnup, and license renewal of up to 20 additional years of operation.”⁸

NUREG-1437 made the following findings:

- Principal radon releases occur during mining and milling operations and as emissions from mill tailings;
- The long-term integrity of the coverings for stabilized mill tailings piles must be maintained because the EPA and NRC regulatory standards (40 CFR Part 192 and 10 CFR Part 40, Appendix A) require certification of stability and the control of average radon flux levels to 20 pCi/m²-s;
- The design and implementation of the radon cover and erosion protection features are the primary reliance for maintaining radon emissions within the 10 CFR Part 40 limits and significant failure of the coverings for stabilized mill tailings piles is considered highly unlikely;
- A combination of engineering and institutional controls will most likely result in compliance with the 20 pCi/m²-s flux standard for the foreseeable future;

⁸ NUREG-1437, § 6.1 (p. 6-1).

- For long-term radon releases from stabilized mill tailings piles, the NRC staff has assumed that the tailings would emit, per reference reactor year (RRY),⁹ 1 Ci/year for 100 years (covering fully intact), 10 Ci/year for the next 400 years (covering partially failed), and 1 Ci/year for periods beyond 500 years (covering failed).¹⁰
- The doses from radon-222 emissions from mines and tailings piles consist of tiny doses summed over large populations (the doses are very small fractions of regulatory limits, and even smaller fractions of natural background exposure to the same population); and
- As each uranium fuel cycle facility licensee must ensure that the radioactive dose from such facility is within the limit and be as low as reasonably achievable (ALARA), the doses to individual members of the public are considered by the NRC staff to be small.

NUREG-1437 served as the basis for the NRC rulemaking which amended 10 CFR Part 51, insofar as license renewal impact considerations are concerned. This rulemaking summarized the NUREG-1437 findings regarding the impacts of radon-222 emissions and stated that “impacts on individuals from radioactive gaseous and liquid releases including radon-222 and

⁹ The “reference reactor” is a model 1000-MW(e) light-water reactor. One reference reactor year (RRY) would be one year of operation of such model reactor.

¹⁰ NUREG-1437 sets forth the NRC staff’s radon-222 data in tabular format: Table 6.1 (p. 6-10) shows data for radon releases from mining and milling operations and mill tailings piles for each RRY; Table 6.2 (p. 6-10) shows data for the estimated 100-year environmental dose commitment from mining and milling for each RRY (*i.e.*, prior to closure or stabilization of the tailings piles); Table 6.3 (p. 6-12) shows population-dose commitments from unreclaimed open-pit mines for each RRY; and Table 6.4 (p. 6-12) shows population-dose commitments from stabilized tailings piles for each RRY.

technetium 99 are small.”¹¹ The NRC provided ample opportunity for public comment on both the draft and final versions of NUREG-1437 and the related amendments to Part 51, including the issue concerning the impacts of radon-222 emissions.¹²

Although NUREG-1437 concerned license renewals, the NRC notes that the NUREG-1437 radon-222 impact determination is not unique to the fuel cycle for renewed licenses and can be applied to all NRC actions. In this regard, the NRC has received, and expects to continue to receive, applications for licenses to build and operate new nuclear power plants. For these applications, the NRC assesses the validity of the value for radon-222 in the environmental report submitted by the applicant for a construction permit, early site permit, or combined license for a nuclear power reactor to determine any impacts to the environment. The NRC staff scales data to the model reactor described in NUREG-1437 to arrive at figure for the expected radon-222 emissions resulting from the operation of the proposed plant. The health, safety and environmental impacts of the expected radon-222 emissions are evaluated on an application-specific basis, using the NUREG-1437 generic analysis and assessment.¹³

The NRC has determined that, at this time, revising the value for radon-222 in Table S-3, as requested in PRM-51-1, does not provide any benefit over the NRC’s current application-

¹¹ 61 FR 28467, 28494 (June 5, 1996), now codified at 10 CFR Part 51, Subpart A, App. B, Table B-1.

¹² 56 FR 47016, 47022 (September 17, 1991) (proposed rule); 61 FR 28467, 28477-78, 28494 (June 5, 1996) (final rule). The June 5, 1996 final rule provided for an additional 30 day comment period, requesting that commenters give “specific attention” to a number of issues, including “the cumulative radiological effects from the uranium fuel cycle.” 61 FR 28467. In a December 18, 1996 final rule, the NRC responded to the one comment received on the radiological impacts of the uranium fuel cycle, from EPA, which requested clarification on the collective effects, over time, on human populations. 61 FR 66537, 66539-40 (December 18, 1996). The December 18, 1996 final rule made minor clarifying and conforming changes to 10 CFR Part 51.

¹³ See, e.g., NRC final environmental impact statements for early site permits to construct new nuclear reactor facilities at Dominion’s North Anna Power Station, in Louisa County, Virginia (NUREG-1811, § 6.1.1.5); Exelon’s Clinton Power Station, near Clinton, Illinois (NUREG-1815, § 6.1.1.5); and Entergy’s Grand Gulf Nuclear Station, near Port Gibson, Mississippi (NUREG-1817, § 6.1.1.5),

specific review. In Staff Requirements Memorandum COMGBJ-07-0002, dated August 6, 2007, the Commission agreed that PRM-51-1 should be closed.

Conclusion

For the reasons described above, the NRC finds that a rulemaking to revise the radon-222 value in Table S-3 is not necessary. The NRC's prior deletion of the value for radon-222 in Table S-3 did grant, in part, the petitioner's request regarding the value for radon-222. The Commission is now denying the remaining outstanding issue of the petitioner's request by not revising Table S-3 to include a revised value for radon-222.

Closing the petition does not preclude the NRC from taking future regulatory action to amend Table S-3. The NRC will continue to evaluate, as part of its annual review of potential rulemaking activity, the need to amend Table S-3.

For the reasons cited in this document, the NRC denies this petition.

Dated at Rockville, Maryland, this 11th day of March, 2008.

For the Nuclear Regulatory Commission.

/RA/

Luis A. Reyes,
Executive Director for Operations.

specific review. In Staff Requirements Memorandum COMGBJ-07-0002, dated August 6, 2007, the Commission agreed that PRM-51-1 should be closed.

Conclusion

For the reasons described above, the NRC finds that a rulemaking to revise the radon-222 value in Table S-3 is not necessary. The NRC's prior deletion of the value for radon-222 in Table S-3 did grant, in part, the petitioner's request regarding the value for radon-222. The Commission is now denying the remaining outstanding issue of the petitioner's request by not revising Table S-3 to include a revised value for radon-222.

Closing the petition does not preclude the NRC from taking future regulatory action to amend Table S-3. The NRC will continue to evaluate, as part of its annual review of potential rulemaking activity, the need to amend Table S-3.

For the reasons cited in this document, the NRC denies this petition.

Dated at Rockville, Maryland, this 11th day of March, 2008.

For the Nuclear Regulatory Commission.

/RA/

Luis A. Reyes,
Executive Director for Operations.

ADAMS Accession No.: ML073320697

OFFICE	PM:PRAB	BC:PRAB	Tech editor	D:DPR	NRO
NAME	SSchneider	JZimmerman	CBladey	MCase	BClayton
DATE	11/23/07	02/27/08	02/27/08	11/29/07	11/26/07
OFFICE	ADM	OGC*	NRR:D	EDO	
NAME	MLesar	BJones (APessin for)	JDyer	LReyes	
DATE	11/29/07	02/25/08	02/29/08	03/11/08	

OFFICIAL RECORD COPY