[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 54

[Docket No. PRM 54-1]

Union of Concerned Scientists;
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 submitted by the Union of Concerned Scientists (UCS or the petitioner) (PRM 54-1). The petitioner requested that the NRC amend its regulations to address concerns about potential aging degradation of liquid and gaseous radioactive waste management systems. The bases for the denial are that the liquid and gaseous radioactive waste management systems are not involved in design and licensing basis events considered for license renewal and that the existing regulatory process is acceptable for maintaining the performance of the radioactive waste systems throughout the period of extended operation in order to keep exposures to radiation at the current levels below regulatory limits consistent with the conclusions made in the applicable regulations.

ADDRESSES: Copies of the petition for rulemaking, the public comments received, and the NRC's letter of denial to the petitioner are available for public inspection or copying for a fee, at the NRC's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. These documents are also available at the NRC's rulemaking Web site at http://ruleforum.llnl.gov.

FOR FURTHER INFORMATION CONTACT: Stephen S. Koenick, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-1239, e-mail ssk2@nrc.gov.

SUPPLEMENTARY INFORMATION:

Background

By letter dated May 3, 2000, UCS submitted a petition for rulemaking (PRM) seeking to revise 10 CFR Parts 54 and 51. The petitioner requested that the NRC regulations governing requirements for renewal of operating licenses for nuclear power plants be amended to address concerns about potential aging degradation of liquid and gaseous radioactive waste systems. The petitioner believes the degradation from aging of piping and components of liquid and gaseous radioactive waste systems at nuclear power facilities may result in increased probability of and/or consequences from design and licensing bases events. In addition, the petitioner believes that the conclusions made in Appendix B to 10 CFR Part 51, Subpart A, that public and occupational exposures to radiation will continue at the current levels below regulatory limits would only be valid if these systems are covered by aging management programs throughout the license renewal term.

A notice of receipt of the petition was published in the *Federal Register* on July 10, 2000 (65 FR 42305). The comment period closed on September 25, 2000. The NRC received letters from 12 commenters. Eleven of the comment letters opposed the petition. Ten of those letters were from nuclear utilities and the 11th was from the Nuclear Energy Institute (NEI). The 12th commenter, a member of the public, supported the petition. A discussion of the comments is provided in this document.

This rulemaking petition was included as part of a petition pursuant to 10 CFR 2.206 in which the petitioner detailed concerns related to the review of the license renewal application submitted by the owner of the Hatch Nuclear Plant. Specifically, the petitioner was concerned that the license renewal application for the Hatch facility did not address deficiencies it believed existed in the aging management of the liquid and gaseous radioactive waste systems. The petitioner concluded that the requirements pertaining to renewal of operating licenses for Hatch and other nuclear power plants do not adequately address degradation from aging of liquid and gaseous radioactive waste systems. The NRC issued an October 18, 2000, letter to UCS, "Director's Decision Under 10 CFR 2.206." The Director's Decision disagreed with the petitioner's contentions and concluded that the Hatch Nuclear Plant was being operated consistent with its design and licensing bases because the material condition of piping, tanks, and other components of the liquid and gaseous radioactive waste management systems was being properly inspected and maintained.

The Petition

UCS requests the NRC revise 10 CFR Part 54, and Part 51 if appropriate, to specify that the liquid and gaseous radioactive waste management systems must be covered by aging management programs during the license renewal term. With respect to 10 CFR Part 54, the petitioner states that potential aging degradation of the liquid and gaseous radioactive waste management systems at the Hatch Nuclear Plant identified in the accompanying 10 CFR 2.206 petition, may result in an increase in the probability of and/or consequences of design and licensing bases events. In addition, the petitioner states that the potential aging degradation may also apply to liquid and gaseous radioactive waste management systems at other plants in

the United States. The petitioner cites 10 CFR 54.4 (a)(1)(iii)[1] as the scoping criterion that has been interpreted in previous license renewal applications to exclude the liquid and gaseous radioactive waste management systems from aging management consideration under the rule. The petitioner also requests 10 CFR Part 51 be revised, if appropriate, to clarify that the liquid and gaseous radioactive waste management systems must be covered by aging management programs during the license renewal term. The petitioner states that the conclusions made in Appendix B to 10 CFR Part 51, Subpart A, that radiation exposures to the public and occupational exposures to workers during the license renewal term will continue at current levels below regulatory limits, were predicated on the liquid and gaseous radioactive waste management systems not experiencing greater failure rates throughout the license renewal term. However, aging degradation of the radioactive waste management systems could lead to an increase in component failure rates, thereby, invalidating the conclusions.

Public Comments on the Petition

The NRC received letters from 12 commenters. Eleven of the comment letters opposed the petition. Ten of those letters were from nuclear utilities and the 11th was from NEI. The comments opposed to the petition were similar in nature and will be discussed together. The 12th comment was from a member of the public who supported the petition. Summaries of the comments and NRC's responses follow.

Comments opposed to the petition: The NEI comments were endorsed by each of the utilities providing comments. NEI recommended that the NRC deny the petition on the following

[1] "The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in § 50.34(a)(1), [§ 50.67(b)(2); sic], or § 100.11 of this chapter, as applicable."

basis: “The design and licensing basis of the liquid and gaseous radwaste systems are sufficiently conservative such that the required analyses demonstrate that the *assumed* catastrophic failure of components in the systems will result in doses substantially below 10 CFR Part 100 guidelines and consistent with 10 CFR Part 20 guidelines [emphasis added]. In other words, the radiological inventory in these systems is controlled and limited, and a postulated event or malfunction will not adversely impact public health or safety. Thus, there is no safety benefit to including these systems within the scope of license renewal for either aging management reviews (Part 54) or environmental impacts (Part 51).”

Response: The NRC agrees in principle with the comments opposing the petition because the liquid and gaseous radioactive waste management systems are conservatively designed to ensure that the consequences of catastrophic failures of components will be well below the scoping threshold for license renewal. However, the commenters provide a limited basis for denying the petition and do not address the petitioner’s assertion about the conclusions made in Appendix B to 10 CFR Part 51, Subpart A. However, as set forth below in the “Reasons for Denial,” the NRC staff has concluded that the current regulatory process is adequate to manage the performance of these systems without additional aging management consideration, so that radiation exposures to members of the public and occupational exposures will remain at current levels below regulatory limits throughout the license renewal term.

Comment supporting the petition: The commenter generally supported the petition and was also concerned about coatings in general, their application, and their degradation. In addition, the commenter discussed the application of coatings to dry casks for storing spent nuclear fuel and the hydrogen gas ignition event at Point Beach Nuclear Plant on May 28, 1996.

Response: The commenter did not provide any additional information on coatings as they apply to radioactive waste management systems. The commenter's discussion on

coatings, in general, and the application to dry casks for storing spent nuclear fuel are not relevant to the issue of radioactive waste management system functionality. Therefore, they do not support the petition. However, for information on use of coatings under nuclear plant operating licenses, the NRC issued Generic Letter 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant-Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment," dated July 14, 1998, and Regulatory Guide 1.54, Revision 1, "Service Level I, II, and III Protective Coatings Applied to Nuclear Plants," dated July 2000. Both of these regulatory documents are relevant to coatings under nuclear plant operating licenses.

With respect to coatings for dry cask storage, specifically, the hydrogen gas ignition event at Point Beach Nuclear Plant related to dry cask storage, the NRC issued NRC Bulletin 96-04, "Chemical, Galvanic, or Other Reactions in Spent Fuel Storage and Transportation Casks," dated July 5, 1996. The information requested in the bulletin and the subsequent safety evaluations of the requested information are relevant to the commenter's concerns.

Reasons for Denial

1. *Potential Aging Degradation of the Radioactive Waste Management Systems May Increase the Probability of and/or Consequences of Design and Licensing Bases Events*

The petitioner argues that radioactive waste management systems should be covered by aging management because potential aging degradation may increase the probability of and/or consequences from design and licensing bases events.

The NRC does not agree that aging degradation of these systems would increase the probability of and/or consequences of design basis events that would necessitate consideration within the scope of the license renewal. The scope of license renewal was based on the NRC's determination that with the possible exception of certain plant systems, structures, and components, the regulatory process is adequate to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety. Also, the plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term. Based on this determination, the scope of the rule focuses on systems, structures, and components that are of principal importance to the safety of the plant.[2] As the petitioner concedes, the liquid and gaseous radioactive waste management systems have no intended functions which are considered by the Commission to be of principal importance to the safety of the plant (that is why these systems do not fall within the scope of systems, structures, and components for which aging management must be considered for license renewal). Furthermore, the consequences of any failure of a radioactive waste component were analyzed during the initial license review and are bounded by the 0.5 rem acceptance criterion, which is a small fraction of the 10 CFR Part 100 limits used in the scoping criteria of license renewal cited by the petitioner.

In the related 10 CFR 2.206 petition on the Hatch Nuclear Plant, the petitioner did not identify any new failure mechanisms or consequences associated with operations of the liquid or gaseous radioactive waste management systems or any intended functions that prevent or mitigate consequences of design basis accidents that would cause the NRC to reconsider its determination not to specifically include radioactive waste management systems within the scope of license renewal pursuant 10 CFR Part 54. In the absence of such new information,

[2] "Statements of Consideration," for 10 CFR Part 54 [60 FR 22464; May 8, 1995].

the NRC continues to believe that the current regulatory process is acceptable to manage the performance of these systems throughout the license renewal term without the need for additional aging management considerations. Therefore, Part 54 adequately maintains public health and safety as issued and does not need to be revised to include radioactive waste management systems.

2. *Aging Degradation of the Radioactive Waste Management Systems Could Lead to an Increase in Component Failure Rates; thereby, Invalidating the Conclusions Made in Appendix B to 10 CFR Part 51, Subpart A*

The petitioner claims that the conclusions made in Appendix B to 10 CFR Part 51, Subpart A are predicated on the assumption that components of the liquid and gaseous waste management systems do not experience greater failure rates throughout the license renewal term.

In addressing environmental effects in Appendix B to 10 CFR Part 51, the Commission determined that the impact of radiological exposures to the pubic and occupational exposures would be “small.” In the context of assessing radiological impacts, this “small” significance determination was defined in Footnote 3 of Table B-1 of Appendix B to 10 CFR Part 51, Subpart A as impacts that do not exceed permissible levels in the Commission's regulations. The data supporting Appendix B were contained in NUREG-1437, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants” (hereinafter the GEIS).

Contrary to the petitioner’s assertion, the conclusions in the GEIS relied on the current regulatory process which manages the performance of the radioactive waste management systems to control radioactivity in effluents to below permissible levels, irrespective of any system degradation. For radiation exposures to the public, the GEIS states, “Radiation doses

to members of the public from current operation of nuclear power plants have been examined from a variety of perspectives and the impacts were found to be well within design objectives and regulations in each instance. No effect of aging that would significantly affect the radioactive effluents has been identified." The GEIS concludes, "No mitigation measures beyond those implemented during the current term license would be warranted because *current mitigation practices* have resulted in declining public radiation doses and are expected to continue to do so." For occupational exposures, the GEIS concludes, "the average dose increase of 5 to 8 percent to the typical plant worker would still maintain doses well below regulatory limits. Therefore, occupational radiation exposure during the term of the renewed license meets the standard of small significance. No mitigation measures *beyond those implemented during the current term* license would be warranted because the ALARA process continues to be effective in reducing radiation doses [emphasis added]." These GEIS findings were therefore based upon the existence of and successful implementation of radiation control and mitigation practices by licensees to comply with the NRC regulatory requirements with respect to radiation exposures, *irrespective of the cause*.

For general protection against ionizing radiation, licensees must comply with 10 CFR Part 20, "Standards for Protection Against Radiation." The regulations contain requirements for radiation protection programs and specify both occupational and public exposure limits. The underlying requirement governing radiation protection is to maintain occupational doses and doses to members of the public as low as is reasonably achievable (ALARA). In addition to complying with NRC standards, licensees must comply with the Environmental Protection Agency's environmental radiation standards contained in 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations."

Early industry experience demonstrated that licensees generally maintained exposures to radiation and releases of radioactivity in effluents at levels well below 10 CFR Part 20 limits. To enhance the regulatory framework for 10 CFR Part 20 for assuring that releases of radioactivity in effluents are ALARA, the NRC issued 10 CFR 50.34a, 10 CFR 50.36a,[3] and Appendix I to 10 CFR Part 50.[4] To comply with these regulations, licensees must identify design objectives, and the means to be employed, for keeping levels of radioactive material in effluents to unrestricted areas ALARA during normal operations, including expected operational occurrences. The licensees' Technical Specifications require that operating procedures for the control of effluents be established and followed; that equipment installed in the radioactive waste system is maintained and used; and that effluent releases are reported. To implement the Technical Specifications, the licensees are required to establish a surveillance and monitoring program to detect and measure radioactivity levels in effluents. If there is an increase of radioactivity in effluents beyond Technical Specifications, irrespective of the cause, then a licensee must identify the cause, take corrective actions, and return the radioactivity levels in effluents to within Appendix I to 10 CFR Part 50 design objectives. Subsequent to the Technical Specifications being exceeded, the licensee must submit a report to the NRC.

For occupational radiation exposures, 10 CFR Part 20 contain both occupational exposure limits and the ALARA requirement. To meet these requirements, licensees have radiation protection programs which routinely monitor plant workers for radiation exposure when working in radiation areas, including areas that contain the radioactive gaseous and liquid

[3]10 CFR 50.34a, "Design Objectives for Equipment to Control Releases of Radioactive Material in Effluents - Nuclear Power Reactors," and §50.36a, "Technical Specifications on Effluents From Nuclear Power Reactors" [35 FR 18385; December 3, 1970].

[4]Appendix I to 10 CFR Part 50, "Numerical Guides for Design Objectives and Limiting Conditions for Operation To Meet the Criterion 'As Low As Is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents" [40 FR 19442; May 5, 1975].

waste management systems. Operational experience has demonstrated that the licensees have been effective in maintaining occupational doses ALARA. There is nothing to suggest -- and the petitioner cites no new information in support of a supposition -- that licensees are unable or unwilling to address ALARA taking into account any possible failures of radioactive waste management systems resulting from aging degradation.

Aside from the licensees practices and programs for ALARA and Technical Specifications compliance, the NRC has an inspection program that includes the liquid and gaseous radioactive waste management systems. Although these systems have historically been considered to have a low risk significance because of the nuclear industry's compliance with the ALARA design objectives in Appendix I to 10 CFR Part 50, routine, periodic inspections are required in order to maintain confidence that the systems are actually maintaining doses from radioactive effluents ALARA. Thus, the liquid and gaseous radioactive waste management systems are explicitly identified in NRC Inspection Procedure 71122, "Public Radiation Safety." The objective of the inspection is to verify that the licensee is providing adequate protection of public health and safety from exposure to radioactive material released into the public domain as a result of the routine operation of nuclear power plants. The inspections focus on both the gaseous and liquid effluent treatment systems and the radiological environmental monitoring programs. There is also a corresponding inspection procedure for occupational radiation safety. The primary objective of NRC Inspection Procedure 71121, "Occupational Radiation Safety," is to gather information to verify that a licensee is meeting the objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine operation.

In addition to performing these inspection procedures, NRC resident inspectors regularly tour the plant, including areas containing radioactive waste management systems. If a degraded condition is identified by the licensee or reported to the licensee by the NRC, the

condition is evaluated and corrective action taken as appropriate in accordance with the plant's corrective action program. In addition, condition reports are trended by licensees. Further evaluation is done and appropriate corrective actions are taken if an adverse trend is identified. Periodic inspections of the corrective action program are conducted in accordance with NRC Inspection Procedure 71152, "Identification and Resolution of Problems," to verify that licensees are identifying and correcting plant problems. The regulatory oversight process increases public confidence and complements the performance-based regulations that establish exposure limits and design objectives to not only meet those limits but to keep radiological dose levels ALARA.

In summary, the NRC has regulatory requirements and licensees implement programs and practices that provide reasonable assurance that exposures to radiation will remain within permissible levels consistent with Appendix I to 10 CFR Part 50 design objectives for public exposures and within 10 CFR Part 20 limits and ALARA for occupational exposures, irrespective of the cause. The Commission has determined that maintaining doses within these design objectives and dose limits represent "small" environmental consequences. The petitioner did not raise any information that would challenge the conclusions of the GEIS that the impacts of radiation doses to the public and occupational exposures will be "small" for the license renewal term.

Conclusion

The NRC staff finds that the information presented in the petition does not support rulemaking to revise 10 CFR Parts 51 and 54 to include aging management of the liquid and gaseous radioactive waste management systems during the license renewal term. If new information in the future provides a basis that aging degradation of the liquid and gaseous

radioactive waste management systems needs aging management consideration under 10 CFR Parts 51 and 54, then the NRC may revisit the need for rulemaking.

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

Dated at Rockville, Maryland, this 5th day of December, 2001.

For The Nuclear Regulatory Commission.

/RA/

William D. Travers,
Executive Director for Operations.