

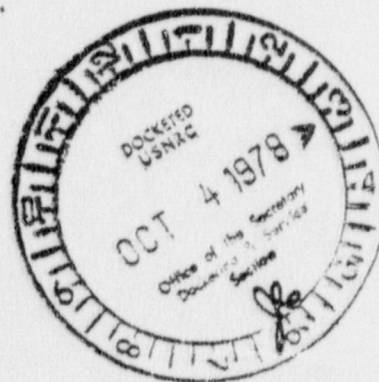
NRC PUBLIC DOCUMENT ROOM

RM-50-3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

DOCKET NO. RM-50-3
SUBJECT: PR-5(43FR39801)

Because the updating of the Environmental Survey of the Uranium Fuel Cycle is closely related to the S-3 Hearing on Reprocessing and Waste Management, the NRC is sending copies of the attached Federal Register notice to the entire service list for Docket No. RM-50-3. The date given at the end of the notice for submission of public comments contains a typographical error. The correct date is October 20, 1978.



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proposed rules

This section of the FEDERAL REGISTER contains notices to the public of the proposed rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the final rules.

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[7590-01]

NUCLEAR REGULATORY COMMISSION

[10 CFR Part 51]

LICENSING AND REGULATORY POLICY AND PROCEDURES FOR ENVIRONMENTAL PROTECTION

Environmental Survey of the Uranium Fuel Cycle

AGENCY: Nuclear Regulatory Commission.

ACTION: Advance notice of intent to update WASH-1248 (supporting document for table S-3, 10 CFR 51.20).

SUMMARY: On April 14, 1978, the U.S. Nuclear Regulatory Commission published in the FEDERAL REGISTER a brief description of a plan to update and revise the supporting documents which described the technical basis for the fuel cycle rule known as table S-3 of the Commission regulation in 10 CFR Part 51, "Licensing and Regulatory Policy and Procedures for Environmental Protection." This rule assesses and tabulates the environmental effects from the uranium fuel cycle ascribable to an individual nuclear power reactor so that they can be considered in connection with issuance of a construction permit or operating licensing for a light water nuclear power reactor. The supporting documents include WASH-1248, "Environmental Survey of the Uranium Fuel Cycle", with its supplement 1 (NUREG-0116, "Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle") and supplement 2 (NUREG-0216, which presents staff responses to comments on NUREG-0116) and the current Hearing Board record, Docket No. RM-50-3, in the matter of uranium fuel cycle impacts from spent fuel reprocessing and radioactive waste. A preliminary outline of an updated environmental survey report has subsequently been developed. This notice indicates the Commission intention to update these supporting documents and invites comment on the outline and on the study in general, its scope, content, calculational methodology, format, relative emphasis to be given the various components, or other pertinent matters.

DATES: The comment period expires October 20, 1978.

FOR FURTHER INFORMATION CONTACT:

John K. Lerohl, Technology Assessment Branch, Division of Fuel Cycle and Materials Safety, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, 301-427-4133.

SUPPLEMENTARY INFORMATION:

The table S-3 fuel cycle rule was promulgated on April 22, 1974 (39 FR 14188) as an amendment to 10 CFR Part 50, "Licensing of Production and Utilization Facilities." The rule included a table (S-3) listing the environmental effects from the uranium fuel cycle activities that are ascribable to the provision of the annual fuel requirement for a light water reactor. All the fuel cycle activities from uranium mining through spent fuel disposal were evaluated. The original intent of the rulemaking was that table S-3 values would be used by the applicant and staff in the environmental review and the preparation of environmental impact statements assessing the overall environmental costs of the licensing of an individual nuclear power reactor. With the use of the values in table S-3, no further discussion (explanation or justification) of those fuel cycle environmental effects was required. The original supporting document, providing justification for the values in the rule, was published as WASH-1248, "Environmental Survey of the Uranium Fuel Cycle," in April 1974.

The fuel cycle rule and its supporting document were prepared to determine the environmental effects generically because the evaluation of issues generically would avoid considering the same environmental issues repeatedly in individual reactor licensing proceedings. With the promulgation of the original generic rule, the Commission noted that the study should be reexamined from time to time to accommodate new technology and new information.

Since the initiation of this rule, there have been two major amendments. On March 14, 1977 (42 FR 13804), an interim rule was promulgated to incorporate revised values for the environmental effects from waste management and fuel reprocessing portions of the fuel cycle.¹ Two techni-

¹ This revision to the rule became necessary when the U.S. Court of Appeals (D.C. Circuit) on July 21, 1978, set aside the portions of the rule relating to waste disposal

cal reports. NUREG-0118 and NUREG-0216, were published as supplements to the WASH-1248 survey to support the interim rule. By notice of May 20, 1977, rulemaking proceedings were reopened with the subject matter confined to the environmental effects of spent fuel reprocessing and radioactive waste management in the light water reactor uranium fuel cycle, and to the question whether the outcome of the interim rulemaking should be made permanent for future use, or if it should be altered and in what respects (42 FR 26987). The rule making proceedings are now being completed.

On April 14, 1978, the fuel cycle rule was again amended, principally by removing the value provided in table S-3 for releases of radon during uranium mining and milling operations. The NRC staff has revised upward its estimates of radon releases. The Commission decided that, pending possible generic rulemaking on the radon issue alone at a later date, the estimates of radon releases could henceforth be considered in individual reactor licensing proceedings.

The above amendments to the fuel cycle rule were limited in scope to specific portions of the fuel cycle or to individual effluents and did not fulfill the intent of overall periodic updating prescribed in connection with the original rule promulgated in 1974. Therefore, the Commission is preparing to perform the overall updating of the environmental survey. The current study to update the environmental survey will reevaluate the format and content of the table S-3 to determine the manner for most effectively characterizing environmental effects. The study will also review and evaluate the results from a wide range of applicable NRC and other agency research and analysis programs. The importance of new concepts and technologies, such as centrifuge enrichment, mining by in situ leaching, and spent fuel disposal will be considered. In addition to the subject matter evaluated in depth in the original study, new information is expected to be available to permit a more detailed consideration of matters of occupational exposure of workers, decommissioning of facilities, and the impact of nonradio-

and reprocessing and remanded for further consideration. On April 13, 1978, the U.S. Supreme Court subsequently reversed and remanded the Appellate Court decision for additional consideration.

logical effluents. A proposed outline of the content of the overall study is provided in the appendix set forth below. Some of the specific subjects to be addressed and for which public comment is particularly invited are the following:

(a) *Characterizing the Industry.* The environmental impact of operating a reactor over its lifetime of 30-40 years must be evaluated in the preparation of the cost/benefit analysis required for licensing the reactor. Thus, the staff plans to consider the cumulative effects from the supporting fuel cycle facilities over that period, based primarily on the application of available or nearly available commercial technology at the present time or conceived for the near term future. Because of the current national policy, the study will assume that the U.S. industry will not reprocess spent fuel and the major study effort will be based upon the assumption of interim storage and disposal of spent fuel. However, an analysis adequate to bound the estimated environmental effects from spent fuel reprocessing has been carried out in the recent Hearing Board record, docket No. RM-50-3, and it is planned that the study will include some consideration of this alternative also.

(b) *Very Long Term Impacts.* When determining the environmental impact from effects that may continue for thousands of years, such as the release of radioactive radon gas from uranium mill tailings, and appropriate time period for meaningful projections and calculations must be chosen. In current individual reactor hearings on radon releases, the NRC staff has used a period of about 500-1,000 years as the upper limit for reasonable projections. For projections beyond that period, some parties have suggested that public recognition be given to the fact that radon releases of some magnitude will probably continue for much longer periods but with indeterminate consequences which the NRC can only attempt to evaluate by comparing the very long term releases with releases from natural background sources.

(c) *Calculation of Population Exposure and Health Effects.* The study will attempt to include the calculation of population exposure and resulting health effects for environmental releases from the uranium fuel cycle. It is recognized that there is much controversy over issues such as the possibility of a threshold for human response at low radiation exposures and low dose rates, and that major national studies are now being directed to improve our understanding of these important issues. It has been proposed that a no-threshold criterion and a

linear relationship between response and radiation dose be assumed for the updating study.

(d) *Excluded Subject Matter.* Since the cost/benefit analysis performed for each licensing decision concerning a nuclear power reactor must compare environmental costs of the nuclear plant with costs from alternative actions such as using fossil fuel energy sources, it has been argued that there is some merit to including in table S-3 a comparable analysis for coal. In current reactor licensing actions, the environmental impacts from coal as an alternative energy source are examined and NRC studies are being performed to improve those estimates. However, it is presently believed that to keep the scope of the uranium fuel cycle update studies within manageable bounds, the studies should exclude consideration of alternative actions. A survey of the environmental impact from coal as an alternative energy source is under review in other NRC activities and will be considered separately.

The question of whether or not to include fuel cycle economic costs in a generic rulemaking has been reviewed by the NRC staff. The staff has concluded that the important elements of fuel cycle cost determination are specifically within the control of the individual applicant, are a part of the applicant's submission to the Commission, and are more appropriately covered in individual proceedings. In addition, the staff believes that a generic rule for fuel cycle costs probably would not remain up to date very long, considering the recent history of rapid change in costs of uranium fuel and other fuel cycle services, and therefore, the inclusion of cost data in a generic rulemaking would be inappropriate.

Comments on the outline attached in the appendix and on the aforementioned subjects should be provided by October 1, 1978, to:

John K. Lerohl, Chief, Technology Assessment Branch, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Dated at Washington, D.C., this 30th day of August 1978.

For the Nuclear Regulatory Commission.

CLIFFORD V. SMITH, JR.,
Director, Office of Nuclear
Material Safety and Safeguards.

APPENDIX—ENVIRONMENTAL SURVEY OF THE URANIUM FUEL CYCLE

PROPOSED CONTENTS

Abstract

Summary, including proposed revised table S-3:

1. Introduction and purpose.
2. Background for this updating.
3. Assumptions and general methodology: Description of the industry. Approach. Scope.
4. Applicable Federal and State regulatory limits and criteria:
 - 4.1 Radiological: EPA 40 CFR Part 190. NRC 10 CFR Part 51. Other Federal Government regulations.
 - 4.2 Nonradiological: Air quality. Water quality. Solid wastes.
5. Description of components of the uranium fuel cycle and analysis of environmental impacts:

Chapter 5 would consist of 10 major sections each concerned with a component of the fuel cycle. Each section would contain the elements with headings or their equivalents as specified in detail under section 5.1 for uranium mining.

 - 5.1 Uranium mining: Description of the process. Environmental considerations. Natural resource use. Radioactive and chemical effluent releases during normal operations and from accidents. Occupational exposure. Decontamination and decommissioning. Long-term management of radioactive wastes. Resulting population exposure and health effects. Summary of environmental impacts.
 - 5.2 Uranium milling.
 - 5.3 Uranium hexafluoride production.
 - 5.4 Uranium enrichment.
 - 5.5 UF₆ conversion and fuel fabrication.
 - 5.6 Interim spent fuel storage.
 - 5.7 Permanent spent fuel disposal.
 - 5.8 Low level waste disposal.
 - 5.9 Transportation.
 - 5.10 Alternate fuel cycle—reprocessing and waste disposal.
6. Overall analysis of fuel cycle environmental impacts:
 - Identification of major issues and impacts. Uncertainties in models and analyses. Analyses of sensitivity to variations in impact parameters. Cumulative impacts of the nuclear industry.
- Conclusions.
7. Proposed fuel cycle rule for 10 CFR 51.20:
 - Format.
 - Content.
 - Applicability.
 - Rationale.

APPENDICES

(To be determined and to be used principally to provide detailed supporting data and calculations for the discussions presented in §§ 5.1 through 5.10)

[FR Doc. 78-25075 Filed 9-6-78; 8:45 am]