

MAY 14 1991

MEMORANDUM FOR: Edward L. Jordan, Chairman  
 Committee to Review Generic Requirements

FROM: Eric S. Beckjord, Director  
 Office of Nuclear Regulatory Research

SUBJECT: CRGR REVIEW OF PROPOSED ENVIRONMENTAL  
 PROTECTION RULE ON NUCLEAR POWER PLANT  
 LICENSE RENEWAL

As you know, the Commission has undertaken a rulemaking effort to generically resolve as many environmental issues as possible in advance of individual license renewal actions, thereby narrowing the set of issues requiring further review in the individual actions. A proposed rule is scheduled to be submitted for review and approval to the EDO on June 19, 1991 and to the Commission on June 28, 1991 and to be issued for public comment in August 1991.

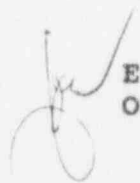
A draft of the proposed rule, together with supporting documents and a draft Commission paper, is enclosed. The Commission paper describes the rule and the supporting documents. The usual CRGR enclosure responding to specific questions has not been prepared for this package since the proposed rule is not a backfit. The rule package has been developed on an interoffice basis with important contributions and participation by RES, NRR, NMSS, and OGC. The package has been concurred in by RES, NRR, NMSS and OGC has no legal objection. It should be noted that the staff is continuing to "clean up" and make consistent some of the language in the supporting documentation. If, in this effort, a change of substance is made we will discuss this with the committee at the May 28, 1991 meeting.

We request CRGR review at the Committee's May 28 meeting, so that the staff would have the benefit of the Committee's advice in completing the Commission review package.

The enclosed material is pre-decisional and is intended for NRC internal use only.

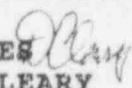

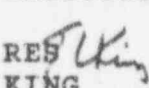
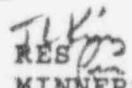

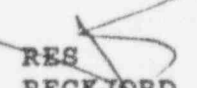
Please contact Donald Cleary (x23936) of my staff if you need any further information regarding this rulemaking package.

Original Signed By  
 Themis P. Speis



Eric S. Beckjord, Director  
 Office of Nuclear Regulatory Research

Enclosure:  
 Draft Commission Paper  
 "Amendment on Environmental  
 Review for Renewal of Operating  
 Licenses," with its enclosures

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cc w/encl.:

D. Allison - AEOD (20)  
J. Craig - NRR  
S. Treby - OGC  
L. Bell - NMSS

For: The Commissioners

From: James M. Taylor  
Executive Director  
for Operations

Subject: PROPOSED RULE ON ENVIRONMENTAL PROTECTION  
REGARDING NUCLEAR POWER PLANT LICENSE  
RENEWAL

Purpose: To obtain Commission approval for publication of a proposed rule on environmental protection regarding nuclear power plant license renewal and the required supporting documents.

Background: The objective of the proposed rule is to contribute to the efficiency of the regulatory process by assessing, on a generic basis, the environmental impacts of renewing the operating license of individual nuclear power plants, and by narrowing the issues that will need to be further analyzed on a case-by-case basis.

In SECY-90-021, dated January 17, 1990, prepared in response to a Staff Requirements Memorandum dated October 11, 1989, the staff submitted a program plan and schedule for completion of a license renewal rulemaking (10 CFR Part 54) and a separate environmental protection rulemaking (10 CFR Part 51). The schedule submitted called for publication of a draft generic environmental impact document and proposed changes to Part 51 in May 1991, and a final generic environmental document and final Part 51 changes in April 1992.

Contact:  
Donald Cleary, RES  
49-23936

In SECY-90-208, dated June 8, 1990, the staff advised the Commission of its intent to publish an advance notice of proposed rulemaking (ANPR) and a notice of intent to prepare a generic environmental impact statement (GEIS). These notices were published in the Federal Register on July 23, 1990 as 55 FR 29964 and 55 FR 29967 respectively. The ANPR explained the purpose of the rulemaking, the possible form of changes to 10 CFR Part 51, the purpose and proposed outline for a GEIS, and plans and schedules for the rulemaking. Comment and recommendations on the proposed rulemaking, especially relative to nine specific questions, were solicited.

In a memorandum dated March 26, 1991, I informed you that the schedule would be extended by 10 weeks. The current schedule calls for publication of the proposed rule on August 9, 1991 and publication of the final rule on June 30, 1992.

The proposed rule package submitted for the Commission's approval includes the draft Federal Register notice containing the proposed environmental protection rule amendments for license renewal (10 CFR Part 51) with its statement of considerations (Enclosure 1), a notice of availability for the GEIS (Enclosure 2), the GEIS (Enclosure 3), a regulatory analysis (Enclosure 4), a regulatory guide (Enclosure 5), and an environmental standard review plan (Enclosure 6).

The GEIS was prepared jointly by Oak Ridge National Laboratory (ORNL) and the staff and has been reviewed by a multidiscipline team of staff members from RES, NRR and OGC. The results of a survey of selected environmental information from nuclear plants conducted by the Nuclear Utilities Management and Resources Council was made available to ORNL by that organization for use in preparing the GEIS.

#### Discussion:

#### Proposed Rule

The proposed change to 10 CFR Part 51 involves: 1) a finding (subject to the successful outcome of items 3 and 4 below) that the renewal of a nuclear power plant operating license for up to a single 20 year period for any plant holding an OL as of June 30, 1992 will have accrued benefits that outweigh the economic, environmental, and social costs; 2) a list of 79 environmental issues for which a generic conclusion has been reached and thus require no further discussion at the time of license renewal (Category 1); 3) a list of 24 issues two of which must be further addressed in every individual license renewal review (Category 3) and 22 of which must be addressed if certain parameters are exceeded (Category 2); 4) a required evaluation of whether the



findings on the 24 issues change the generic funding that the accrued benefits outweigh the economic, environmental and social costs; and 5) the requirement that an environmental impact statement be prepared for the renewal of an operating license, currently in §51.20, has been removed and the new 51.95(c) allows the use of an environmental assessment by the staff. If a finding of no significant impact cannot be made, an environmental impact statement is required.

The proposed rule will require each applicant for license renewal to submit: 1) information on plans for modifications and refurbishment to the facility and any additional tests, inspections and administrative controls being instituted in support of license renewal; 2) analyses of each of the Category 3 and relevant Category 2 issues; and 3) an analysis of whether or not the conclusion reached on the 24 issues overturns the benefit cost findings as stated in Appendix B of Part 51. These changes are incorporated in §51.53 "Supplement to Environmental Report" and §51.95 "Supplement to Final Environmental Impact Statement."

#### Statement of Considerations

The statement of considerations (SOC) is intended to be self-contained, in the sense that the proposed rule's rationale is presented with respect to all the significant considerations. The content and highlights of each section follow.

- I. Introduction -- Overview of SOC
- II. Background -- A general historical perspective of the rulemaking, the environmental review process for licensing nuclear power plants.
- III. Proposed Action -- Explains the rule change, public comments on the ANPR, the major environmental issues associated with the rulemaking, and the regulatory guide and standard review plan. Comments on the ANPR were received from 29 organizations, government agencies and individuals. Only three respondents opposed this rulemaking. The remainder supported it with varying qualifications. The staff believes that the GEIS accommodates all of the environmental protection issues raised in the public comments. A number of issues raised are beyond the scope of the rulemaking and the GEIS.

- IV. Questions -- To direct public comments to issues that NRC believes need to be explored further.
- V. Availability of Documents.
- VI. Environmental Impact -- No separate analysis of the environmental impacts of this rulemaking is required.
- VII. Paperwork Reduction Act Statement -- Reduces the paperwork required of applicants.
- VIII. Regulatory Analysis -- This rulemaking results in future regulatory efficiency including savings of staff and money for the NRC, applicants and the public which outweigh the current cost of the rulemaking.
- IX. Regulatory Flexibility Act Certification
- X. Non-Applicability of Backfit Rule -- Backfit is not applicable.
- XI. Text of Proposed Part 51 Amendments.

#### Generic Environmental Impact Statement (GEIS)

The draft GEIS provides the analytical basis and findings to be codified in the proposed rule. The bounds and significance of potential environmental impacts are assessed. The GEIS analyzes all license renewal environmental issues for all 118 operating or under active construction light water nuclear power reactors in the United States. Four nuclear power reactors, Perry 2, Grand Gulf 2, and WNP 1 and 3 were considered not under active construction and were not included in the GEIS analyses. The scope of these issues reflects the potential effects of plant refurbishment activities associated with license renewal, an additional 20 years of plant operation, and possible changes in plant environmental settings. One hundred-and-three categories of environmental issues were identified and assessed.

Scoping activities performed by the NRC staff included the identification and characterization of issues which needed to be addressed in the GEIS. The public workshop on license renewal in November 1989 included a session on potential environmental effects of

renewal activities. The results of the workshop were reported to the Commission in SECY-90-021. The staff has consulted with the Council on Environmental Quality, the U.S. Environmental Protection Agency, the U.S. Department of the Interior, and other appropriate Federal agencies on the objectives, scope, and approach to the GEIS and the rulemaking. The ANPR, which was mailed to nearly 600 parties, solicited comments on these matters from the public.

The analyses in the GEIS are generally based on an upper bound or worst case approach thereby providing results which encompass all of the plants. This approach was taken in characterizing the activities and plant modifications which can be expected to be undertaken as a result of license renewal and extended plant operation. In Section 2 and Appendix B of the GEIS, an upper bound scenario is used to depict license renewal under 10 CFR Part 54 for a BWR and PWR in terms of the set of refurbishments, replacements and modifications to the facility and its administrative control procedures. This upperbound scenario for license renewal activities was compared with the types of activities that already have been experienced at nuclear power plants and was evaluated to identify any direct channels to the environment.

Of the 103 issues identified and addressed in the GEIS, it was possible to reach a conclusion for all plants for 79 of the issues. Of the remaining issues, a conclusion was reached for all plants that fall within defined bounds for 22 of the issues. Plants that fall outside the defined bounds must assess the issue in their individual license renewal applications. These 22 separate issues which are identified in Table B.1 of proposed Appendix B of Part 51 have been reduced to the 10 issues listed in §51.53(c)(3)(b) by combining similar issues. Only two issues were determined to require a site specific analysis for all plants.

The issues which must be addressed in each license renewal application and the NRC staff's review are:

- (1) Endangered species.
- (2) Transportation impacts on local communities.

The issues which must be addressed in individual applications and the NRC staff's review if certain parameters are exceeded are:

- (1) Status of Clean Water Act 316 (a) or (b) determinations relative to heat shock and impingement and entrainment of fish and shellfish.

- (2) Groundwater quality degradation from cooling ponds.
- (3) Groundwater use conflicts.
- (4) Construction impacts on important terrestrial resources.
- (5) Construction impact controls over soil erosion or spills.
- (6) Housing impacts from increased labor force.
- (7) Health impacts of electric shock from induced currents from transmission lines.
- (8) Health effects associated with recreational use of cooling pond, lake, canal or small river.
- (9) Low-level radioactive waste management arrangements.
- (10) Demonstration of cost advantage of license renewal over the most reasonable replacement technologies.

The GEIS contains a finding that the benefits outweigh the costs of Category 1 issues and bounded Category 2 issues. After addressing each of the relevant issues listed above, each license renewal application and the NRC staff's review must analyze whether the benefit-cost funding reached in the GEIS has been changed.

#### Other Documents

A regulatory analysis, a regulatory guide, and an environmental standard review plan are included as enclosures 4, 5, and 6 to this paper. The regulatory analysis demonstrates that adoption of the proposed rule would reduce the industry and NRC costs of evaluating the environmental impacts resulting from renewing the operating licenses of nuclear power plants. The regulatory guide is a supplement to Regulatory Guide 4.2, Revision 2, "Preparation of Environmental Reports for Nuclear Power Stations" and provides guidance to applicants on the information requirements of §51.53(c). The environmental standard review plan provides guidance to the NRC staff on the review of that information.

Coordination: This paper has been prepared by the Office of Nuclear Regulatory Research with close cooperation from the Office of Nuclear Reactor Regulation, and assistance from the Office of Nuclear Material Safety and Safeguards in

reviewing material on waste management and decommissioning.

The Office of the General Counsel has substantially contributed to this paper, and has no legal objection to it.

The Advisory Committee on Reactor Safeguards (ACRS) has declined to review this proposed rulemaking.

Recommendations: The staff requests that the Commission:

1. Approve for publication in the Federal Register the proposed rule with its statement of considerations, as presented in Enclosure 1, for a 90 day comment period.
2. Approve for publication in the same issue of the Federal Register a notice of availability (Enclosure 2) of the draft generic environmental impact statement, as presented in Enclosure 3, for the same 90 day comment period.
3. Approve the issuance of the draft regulatory analysis, as presented in Enclosure 4, for the same 90 day comment period.
4. Approve the issuance of the draft regulatory guide, as presented in Enclosure 5, for the same 90 day comment period.
5. Approve the issuance of the draft environmental standard review plan as presented in Enclosure 6, for the same 90 days comment period.

6. Note that:
  - a. The staff will submit the Paperwork Certification to OMB in accordance with established procedures.
  - b. The Office of Governmental and Public Affairs will issue a press release concerning publication of the proposed rule and will inform cognizant Congressional Committees.

James M. Taylor  
Executive Director  
for Operations

Enclosures:

1. Federal Register Notice (proposed rule with statement of consideration)
2. Federal Register Notice (notice of availability)
3. Draft Generic Environmental Impact Statement
4. Draft Regulatory Analysis
5. Draft Regulatory Guide
6. Draft Environmental Standard Review Plan



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## FEDERAL REGISTER NOTICE (DRAFT)

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NUCLEAR REGULATORY COMMISSION

## 10 CFR Part 51

Proposed Amendments on Environmental  
Review for Renewal of Operating Licenses

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend 10 CFR Part 51 to establish new requirements for environmental review of applications for renewal of nuclear power reactor operating licenses. The proposed amendments would define the number and scope of environmental issues which would need to be addressed as part of a license renewal application. Concurrent with the proposed amendments, the NRC is publishing for comment a Generic Environmental Impact Statement, Regulatory Guide, Environmental Standard Review Plan, and Regulatory Analysis, which supplement the proposed amendments.

DATE: Comment period expires    /    /   . Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Comments may be sent to: The Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch, or may be hand delivered to One White Flint North, 11555 Rockville Pike, Rockville, MD 20852 between 7:30 am and 4:15 pm Federal workdays. Copies of comments received may be examined at the NRC Public Document Room, 2120 L Street NW(lower level),

Washington, DC 20555 between the hours of 7:45 am and 4:15 pm Federal workdays.

GUIDANCE TO COMMENTERS: Commenters are encouraged to submit, in addition to the original paper copy, a copy of the letter in an electronic format on IBM PC DOS compatible 3.5 OR 5.25 inch double sided density (DS/DD) diskettes. Data files should be provided in ASCII code, or if formatted text is required, data files should be provided in IBM Revisable - Form Text Document Content Architecture (RFT/DCA) format.

FOR FURTHER INFORMATION CONTACT: Don Cleary, Division of Safety Issues Resolution, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 492-3936.

SUPPLEMENTARY INFORMATION:

- I. Introduction
- II. Background
  - A. License Renewal - Part 54
  - B. Environmental Review
  - C. Generic Rulemaking
- III. Proposed Action
  - A. Proposed Part 51 Amendments
  - B. Generic Environmental Impact Statement
  - C. Regulatory Guidance to Support the Amendments
  - D. Public Comments on ANPR
- IV. Questions
- V. Availability of Documents
- VI. Environmental Impact
- VII. Paperwork Reduction Act
- VIII. Regulatory Analysis
- IX. Regulatory Flexibility Act
- X. Backfit Analysis
- XI. Text of Proposed Part 51 Amendments

- I. Introduction

The Commission is proposing amendments to 10 CFR Part 51 that are intended to improve the efficiency of the process of environmental review for those nuclear plants holding an operating license on June 30, 1992 for applicants seeking renewal of operating licenses for up to an additional 20 years. In preparation for possible license renewal applications, the Commission considered the merits of relying on the existing framework for environmental review under Part 51 compared to revision of Part 51. In reaching its decision to amend Part 51 the Commission considered: (1) License renewal will involve nuclear power plants for which the environmental impacts of operation are well understood based on operating experience to date. (2) Activities and requirements associated with license renewal are anticipated to be within the range of experience, thus environmental impacts that have not been evaluated are not expected to occur, (3) Changes in the environment around nuclear power plants are generally gradual and predictable with respect to characteristics important to environmental impact analyses. The Commission has conducted a study of the potential environmental impacts of license renewal. The objective of the study was to identify all the potential impacts associated with plant license renewal, determine which of these impacts could be evaluated generically for all plants, and determine the significance of the impacts which could be generically evaluated. The analyses and results of this study are contained in the draft Generic Environmental Impact Statement (GEIS)(NUREG-1437), which is being published for comment concurrently with these proposed amendments. The GEIS concludes that only a limited number of the total potential impacts cannot be evaluated generically. The impacts which cannot be evaluated generically will have to be evaluated in each individual plant license renewal case. The environmental impacts which were generically evaluated will not have to be evaluated in individual plant license renewal cases.

The GEIS provides the basis for this rulemaking. The development of the GEIS has followed the recommended procedures set out by the Council on Environmental Quality (CEQ), and has included scoping activities such as consultation with CEQ and other Federal agencies, a public workshop held on November 12-14, 1989 (54 FR 41980), and publication of a Notice of Intent to prepare the GEIS (55 FR 29967, July 23, 1990).

The proposed amendments to 10 CFR Part 51 address the potential environmental impacts which are generically evaluated for all plants in the GEIS, and codify the findings made in the GEIS. In addition, those potential impacts which are not generically evaluated in the GEIS are identified in the rule for evaluation on a plant specific basis. By assessing and codifying certain potential environmental impacts on a generic basis, there will be no need to address these impacts in each and every future license renewal case. The proposed amendments should result in considerable savings to both the NRC, and the nuclear utility industry and nuclear utility ratepayers, while assuring that the environmental impacts of license renewal are evaluated, as required by the National Environmental Policy Act (NEPA).

The basic information and the supporting analysis of environmental impacts which serves as the basis of this proposed rulemaking is contained in the draft GEIS, NUREG-1437. The GEIS and these proposed amendments to 10 CFR Part 51 also provide the basis for developing a license renewal supplement to Regulatory Guide 4.2, "Preparation of Environmental Reports for Nuclear Power Stations" which will provide guidance on the format and content of the environmental report to be submitted as part of the license renewal application. Additionally, the staff is also preparing an Environmental Standard Review Plan (NUREG-1429) that will provide guidance to the staff on the scope of the review necessary to implement the proposed amendments to Part 51.

## II. Background

### A. License Renewal - 10 CFR Part 54

A significant number of the operating licenses for the existing nuclear power plants are due to expire in the early part of the twenty-first century. The NRC anticipates that a number of licensees will submit applications for a renewal of their operating license 10 to 20 years prior to the license expiration; the first of these applications is expected in the near future. The NRC has issued a proposed rule, 10 CFR Part 54, Requirements for Renewal of Operating Licenses for

Nuclear Power Plants, (55 FR 29043, July 17, 1990) that would establish the requirements that an applicant must meet, the information that shall be submitted to the NRC for review so that the agency can determine whether these requirements have in fact been met, and the application procedures. The proposed Part 54 permits the renewal of an operating license for up to additional 20 year increments beyond the expiration of its current license (initial licenses authorize 40 years of operation). The Part 54 rule could be applied to multiple renewals of a plant operating license. However, the Part 51 amendments apply to one renewal of the initial license for up to 20 years beyond the expiration of the current license.

Plant license renewal will be based on the current licensing basis, (i.e., the original plant licensing basis as amended during the initial license term), and changes as necessary to address the effects of age-related degradation on systems, structures, and components important to license renewal. An assessment shall be made by the licensee to determine those activities and modifications which are necessary, at the time of license renewal and throughout the renewal term, to ensure continued safe operation of the plant. The licensees shall identify and incorporate those activities necessary for managing aging into its licensing basis thereby ensuring that acceptable margins of safety are preserved throughout the license renewal term. Under 10 CFR Part 54, each applicant for license renewal must submit an environmental report that complies with the requirements of 10 CFR Part 51, the NRC regulations governing environmental protection for domestic licensing.

#### B. Environmental Review

The scope of NRC's National Environmental Policy Act (NEPA) review is found in 10 CFR Part 51. Under the provisions of 10 CFR Section 51.45, the applicant must submit an Environmental Report that discusses the potential impact of the proposed action on the environment, any adverse environmental impacts which cannot be avoided, alternatives to the proposed action, the relationship between local short term uses of the environment and maintenance and enhancement of long term productivity, and any irreversible or irretrievable commitments of resources. In



addition, an analysis is required that considers and balances the environmental effects of the proposed action with the benefits of the action. NRC will independently review this material and publish the results.

Prior to the issuance of a Construction Permit (CP) or an Operating License (OL) for a nuclear power plant, the NRC is required to assess the potential environmental impacts of the plant to ensure that the issuance of a permit or license is consistent with NEPA and the NRC implementing regulations of NEPA in Part 51.

For those plants licensed subsequent to the enactment of NEPA, baseline quantitative studies and monitoring programs were often developed for comparison with data gathered from later programs if adverse effects of construction or operation were reasonably inferred from information obtained during the gathering of pre-construction or operational baseline phases. Such studies were part of the applicant's environmental report and were reviewed in the staff's Final Environmental Statement (FES) for the specific plant. These studies and programs were restricted to the impact assessment of important resources and important species described in the staff's guidance documents such as Regulatory Guide 4.2, and Environmental Standard Review Plans (NUREG-0555). The staff's final assessments of these programs were normally summarized in each plant specific FES. Based upon these reviews, appropriate environmental parameters would have been proposed for monitoring or for special studies.

Additionally, nonradiological discharges of pollutants to receiving waters from operation of nuclear power plants licensed by the NRC are subject to limitations or monitoring under the Federal Water Pollution Control Act (FWPCA) administered by EPA, or designated State agencies. The resultant reporting requirements under a National Pollutant Discharge Elimination System (NPDES) permit are relied upon by EPA and designated State agencies to provide data on potential problems. Permits are subject to review and approval every five years and may be modified by the permitting authority based upon an analysis of data generated from plant specific NPDES monitoring programs.

Although two operating nuclear power plants were licensed prior to NEPA and do not have FES's, all plants have submitted ER's. The GEIS did consider these plants, and the Commission believes that there is no reason for special treatment of these two plants in the environmental review for individual plant license renewal.

The Commission considers that its responsibilities under NEPA include the responsibility to keep informed of significant environmental impacts during the term of plant operations. For impacts involving degradation of the aquatic environment, the reporting requirements of NPDES permits issued pursuant to FWPCA are generally relied upon to alert NRC to potential problems. In addition, the Commission includes conditions in its licenses to protect the environment in accordance with 10 CFR 50.36(b). These conditions identify appropriate requirements for reporting and recordkeeping of environmental data, and of conditions and monitoring requirements for the protection of the nonaquatic environment. A license may also contain under Part 50 references to Environmental Protection Plans, Environmental Technical Specifications and Radiological Technical Specifications. This practice is consistent with regulations promulgated by the Council on Environmental Quality which direct agencies to adopt monitoring and enforcement programs, where appropriate.

Therefore, as a result of the staff's environmental reviews, certain environmental conditions, including monitoring requirements, may be included in NRC licenses. The information generated from these requirements is provided to the NRC on a routine basis, and the Commission may respond where appropriate. Such information was used during the preparation of the GEIS.

### C. Use of Generic Rulemaking

The Commission has previously endorsed the generic rulemaking process and recognized the advantages of generic rulemaking. In an interim policy statement on generic rulemaking to improve nuclear power plant licensing, these advantages were identified:

"(a) enhance stability and predictability of the licensing process by providing regulatory criteria and requirements in

discrete generic areas on matters which are significant in the review and approval of license applications; (b) enhance public understanding and confidence in the integrity of the licensing process by bringing out for public participation important generic issues which are of concern to the agency and the public; (c) enhance administrative efficiency in licensing by removing, in whole or in part, generic issues from staff review and adjudicatory resolution in individual licensing proceedings and/or by establishing the importance (or lack of importance) of various safety and environmental issues to the decision process; (d) assist the Commission in resolving complex methodology and policy issues involved in recurring issues in the review and approval of individual licensing applications; and (e) yield an overall savings in the utilization of resources in the licensing process by the utility industry, those of the public whose interest may be affected by the rulemaking, the NRC and other Federal, State, and local governments with an expected improvement in the quality of the decision process."<sup>1</sup>

The NRC has used this generic approach in several Part 51 rulemakings. Table S-4 of §51.52, which sets forth the environmental impacts of the transportation of radioactive waste and nuclear fuel, is such an example. Applicants meeting certain criteria can use the information in Table S-4 as the basis for their evaluation of the environmental impacts of the transportation of radioactive waste and spent fuel. They are not required to conduct their own analysis of these impacts.

Other examples of past generic Part 51 rulemakings are Table S-3 of § 51.51, which sets forth the environmental impacts of the nuclear fuel cycle; and Sections 51.53 and 51.95, which eliminate the requirement to

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<sup>1</sup>Generic Rulemaking to Improve Nuclear Power Plant Licensing, Interim Policy Statement, 43 FR 58377, December 14, 1978.

consider need for power and alternative energy sources for nuclear reactors at the operating license stage (47 FR 12940, March 26, 1982).

### III. Proposed Action

#### A. Proposed Amendments

The proposed amendments to 10 CFR Part 51 establish new requirements for environmental review of individual plant license renewal applications. These amendments would require the applicant to address only those environmental issues that require a plant-specific assessment as part of an individual plant license renewal application. All applicants will have to assess impacts on threatened and endangered species, and impacts on local traffic conditions during periods of license-renewal related refurbishment activities. For other issues all applicants will have to demonstrate either that their plants fall within defined bounds of plants for which generic conclusions could be reached, or, if they do not fall within these bounds, an assessment of the issue must be presented. Also, as part of its ER, an applicant must include an analysis of whether or not the findings of the above required assessments overturn the favorable cost-benefit balance regarding license renewal found in Appendix B.

The proposed amendments codify the conclusions of the GEIS for those issues for which a generic conclusion can be reached. Proposed Appendix B which summarizes the Commission's findings on the scope and magnitude of environmental and other effects of renewing the operating license of an individual nuclear power plant is added to 10 CFR Part 51. In the proposed appendix, the Commission also states its finding that the initial renewal of any operating license for up to 20 years is advantageous to society and will have accrued benefits that outweigh the economic, environmental, and societal costs of license renewal.

In addition, the proposed amendments eliminate the requirement that in all cases the NRC staff must prepare a supplemental EIS for license renewal applications, and instead permit the staff to prepare an environmental assessment if certain conditions are met. The basis for this pro-

posed change is that only a limited number of potential impacts need to be addressed in individual plant license renewal cases.

The Commission believes that in many instances, this limited set of potential environmental impacts will be found to be nonexistent or very small and therefore could be analyzed in an environmental assessment. However, there may be plant license renewal proceedings where a supplemental environmental impact statement will be required. A supplemental EIS will be required if a Finding of No Significant Impact (FONSI) cannot be concluded in the EA. If no significant impacts are found in the EA, NRC will issue a FONSI for public comment. A FONSI would mean that there are no impacts which could overturn the favorable cost-benefit balance in Appendix B. The staff's environmental review would be concluded.

On the other hand, if the EA should identify environmental impacts which would prevent the issuance of a FONSI, the environmental review process would require the development of a draft for public comment and final supplemental EIS. The supplemental EIS would evaluate the environmental impacts identified in the EA, and their effect on the overall cost-benefit balance.

Final amendments, when promulgated, would define those environmental issues which need to be addressed in individual plant license renewal applications. The Commission wishes to emphasize that it is important for public comment on environmental reviews in the GEIS to be made at this time. After the NRC concludes action on the rulemaking there will be no later opportunity for public comment at the individual plant licensing stage, except for those environmental impacts that require plant-specific evaluation.

The adoption of the proposed amendments would not preclude reopening environmental issues if significant new information becomes available. The Administrative Procedures Act (5 U.S.C. 553 (a)) requires that each Federal agency allow members of the public the right to petition the agency to issue, amend, or repeal a rule. A petition to amend Part 51 will be acted upon if new information warrants a reopening of issues. The Commission plans to periodically review the GEIS findings contained in Appendix B of this Part and supporting documentation.



Environmental Impacts to be Reviewed in Individual Plant License Renewal Cases

Based on the previous discussion, the Commission concludes that the adverse environmental impacts of license renewal are minor relative to the benefits of continued operation for up to an additional 20 years past the initial license period. However, to address those environmental issues for which no generic conclusion can be reached, the proposed amendments require each applicant to address these issues in its Environmental Report. Requirements are placed upon all plants in some cases, and on a subset of plants in others. These requirements summarize Category 2 and 3 conclusions. The issues which must be addressed are;

(1) Potential impacts on threatened and endangered species, that cannot by law be eliminated from review in individual plant license renewal cases, must be assessed

(2) The GEIS identifies the potential aquatic impacts of entrainment, impingement, and heat shock as potential problems at plants with once-through or cooling pond heat dissipation systems plants. However, as the GEIS notes, plant effluents that have the potential to cause these impacts are under the regulatory authority of EPA or State authorities. The required permit process under the FWPCA is an adequate mechanism for control/mitigation of these potential aquatic impacts. If an applicant for relicensing has appropriate EPA or State permits, further NRC review of these potential impacts is not warranted. Therefore, the proposed rule requires an applicant to provide NRC with certification that it holds current FWPCA and NPDES permits, or where State regulation occurs, current State permits. If not, an assessment of these aquatic impacts is required.

(3) The GEIS concluded that potential aquatic impacts from refurbishment activities would be minor or insignificant if best management practices are used to control soil erosion or spills. The proposed rule requires applicants to submit evidence of a construction impact control program.

(4) For plants not located at inland sites or not using cooling ponds, an assessment of groundwater quality impacts is required.



(5) For plants using Ranney wells or pumping 100 or more gallons per minute and having private wells in the cone of depression, an assessment of groundwater use conflicts is required.

(6) For potential terrestrial impacts, the GEIS concluded that the only potential impact which need be evaluated in individual plant license renewal cases was any potential impact on important plant and animal habitats. These could include wetlands, wildlife breeding grounds, and certain plantlife environments. The proposed rule requires applicants to assess any potential impacts on plant and animal habitats if construction activities due to refurbishment or extended operation could affect these resources.

(7) The proposed amendments require any license renewal applicant, whose site does not have access to a low-level radioactive waste disposal facility, to provide an assessment of environmental impacts of low-level waste management.

(8) Each applicant must verify that adequate provisions have been taken to assure that transmission line electric shock effects are not a health hazard. Reliance on National Electric Safety Codes can be used for this assessment.

(9) Applicants at certain sites ( pumping 100 or more gallons per minute and where there are wells in the cone of depression of plant wells, or those using Ranney wells) where groundwater use and/or degradation problems could arise must assess these impacts.

(10) For socioeconomic impacts, all applicants must submit an assessment of potential transportation impacts during refurbishment. An applicant with a plant at a site in low population areas, as defined by numerical criteria on population density, or in areas where growth control measures are in effect must assess housing impacts during refurbishment.

(11) For applicants with plants using cooling ponds, lakes, or canals, or discharging cooling water to small rivers, effects on human health of microbiological organisms must be addressed.

(12) Applicants which exceed a threshold criterion for cost of refurbishment must submit a cost analysis to demonstrate the cost advantages of license renewal over certain alternatives.

## B. Generic Environmental Impact Statement

The GEIS establishes the bounds and significance of potential environmental impacts at all 118 light water nuclear power reactors currently operating and expected to be operating in the United States. All environmental issues that may be of concern to NRC in its reviews of applications for the renewal of operating licenses at the 118 nuclear power plants considered are assessed. The scope of these issues reflects the potential effects of plant refurbishment activities associated with license renewal, an additional 20 years of plant operation, and possible change in plant environmental setting. For this analysis all of the environmental issues identified were combined into 103 issues. For each type of environmental impact, the GEIS attempts to establish generic findings encompassing as many nuclear power plants as possible. Plant and site-specific information is used in developing these generic findings. In conjunction with the proposed rule change, this GEIS also provides power reactor applicants seeking renewal of their operating licenses with information and analyses that may be referenced in their application. Further guidance on the format, content, and analysis standards for environmental documentation in their application is provided in Regulatory Guide 4.2, supplement 1.

The analytical approach to assessing environmental impacts in this GEIS involved four stages. First, characterize each issue based on information from past plant construction and current operating experience to establish a baseline. Second, assess the extent to which activities and requirements associated with license renewal activities may differ from the baseline. Third, assess potential relevant changes in the environment and estimate trends for the technology and economics of alternative energy sources. Fourth, combine these separate analyses to fully characterize the nature and magnitude of impacts and other issues that will result from the refurbishments and replacements necessary for license renewal and the potential environmental impacts of operating plants for 20 years beyond their current 40 year licensing limit.

The upper bound scenario of changes to plants and their operation that may be brought about by license renewal is described in detail in Appendix B of the GEIS. All plants are enveloped by the GEIS. The range of issues considered in the GEIS were identified from past studies of nuclear power plant construction and operation (principally EIS's), consultations with Federal and State regulatory agencies, and input from the nuclear utility industry and the general public.

The analyses in the GEIS drew on an extensive body of published materials from government, industry, academic, and other sources about operation and maintenance of nuclear power plants and their effects on the environment. Additional plant-specific information not otherwise available was collected by the Nuclear Utilities Management and Resources Council (NUMARC) and made available to Oak Ridge National Laboratory (ORNL) for use in the report. A team of environmental specialists from ORNL interviewed local, State, and Federal regulatory officials, as well as persons from business and other private organizations in the vicinity of nuclear power plants, as part of the effort to establish the scope for the GEIS.

The objectives of the GEIS are (1) to provide an understanding of the types and severity of environmental impacts that may occur as a result of renewing operating licenses for nuclear power plants, (2) to identify and assess those impacts expected to be generic to license renewal, and (3) to support this proposed rulemaking by defining the issues that need to be addressed by NRC and the applicants in plant-specific license renewal proceedings.

The broad topical areas covered are surfacewater quality, aquatic ecology impacts, groundwater, terrestrial impacts, human health, socioeconomics, postulated accidents, waste management, decommissioning, need for generating capacity, and alternatives to license renewal.

Conclusions are placed in a framework of three categories: (1) a generic conclusion on the acceptability of the impact can be reached for all affected plants, therefore, the impact need not be evaluated in each individual plant license renewal application, (2) a generic conclusion on the acceptability of the impact can be reached for plants that fall within defined bounds ( For plants that fall outside the defined bounds, licensees must address the issue in their individual license renewal

applications), and (3) the environmental impact must be evaluated in each individual license renewal application.

These conclusions are further categorized according to significance of impact. "Small" impacts are impacts that, in the reviewer's judgment, are of such minor nature that they do not warrant further analysis. "Moderate" impacts are impacts that, in the reviewer's judgement, are likely to be clearly evident (mitigation alternatives are usually considered for moderate impacts). "Large" impacts are impacts that, in the reviewer's judgement, represent either a severe penalty (mitigation alternatives are always considered) or a major benefit.

The GEIS identified 103 environmental issues associated with the renewal of individual plant licenses, and evaluated the significance of the environmental impact of each. For a large number of issues, a generic conclusion that the potential environmental impacts are acceptable was made. For other issues this conclusion could be reached for some subset of all nuclear power plants which were within boundaries specified in the GEIS. For two issues, it was concluded that no generic conclusion on impacts could be reached.

The Commission is proposing to limit the scope of environmental review in individual plant license renewal cases to only those impacts for which no generic conclusion could be reached (Category 2 and 3). All applicants will provide appropriate information and analyses in their license renewal applications for all Category 2 and 3 issues identified in the GEIS.

For the impacts which can be assessed on a generic basis, the Commission is proposing to summarize and present the evaluation of them in a new Appendix B to Part 51. The conclusions of the GEIS have been summarized here. A further step required by NRC's NEPA review procedures in Part 51 is that a draft EIS must include; " a preliminary analysis which considers and balances the environmental and other effects of the proposed action and the alternatives available for reducing or avoiding adverse environmental and other effects, as well as the environmental, economic, technical, and other benefits of the proposed action." [§51.71(d)]. This analysis is found in Section 10 of the GEIS. Table 10.1, "Summary of Conclusions on NEPA Issues" in this section of the GEIS is also included in this notice as proposed Appendix B of Part

51. The table lists each environmental issue addressed by the GEIS, states the conclusions, and provides an assessment of the benefit or cost involved. The major benefit is the electric energy which would be produced by a plant whose license is renewed. The major economic cost is the expense of refurbishment. For those adverse environmental impacts that can be assessed generically (Category 1 and for a subset of plants, Category 2), in each case the adverse impact is identified as small. For environmental issues for which generic conclusions can be reached, Table B-1 shows that there are no adverse environmental impacts that would offset the benefits of license renewal.

The Commission proposes to require applicants to address these issues in individual plant license renewals, and to apply the conclusions derived from an assessment of these issues to the overall balancing in the Appendix B table.

#### Other NEPA Considerations

The other NEPA review requirements in 10 CFR Part 51 are a review of short and long term benefits and productivity, and irreversible commitments of resources. The principal short-term benefit from continued operation of nuclear plants is the production of electrical energy from an existing capital asset.

The Commission finds that the resource commitments involved in license renewal would be a continuation of resource commitments during the initial operating license term. Additional nuclear fuel will be used, and small amounts of materials used for plant refurbishment. A minor amount of additional land would be used.

#### Summary of Issues Analyzed in the GEIS

The following describes those environmental issues that were examined in the GEIS, and summarizes the conclusions by major topical area.

##### 1. Surface Water Quality



The GEIS examined water quality; water use conflicts; altered salinity gradients; altered current patterns; temperature effects on sediment transport; altered thermal stratification; scouring due to discharged cooling water; eutrophication; discharge of chlorine or other biocides or chemical contaminants; and discharge of sanitary wastes,

Aquatic impacts from plant refurbishment activities in support of license renewal could occur at any type of plant if erosion or spills occur. The GEIS concluded that "best management practices" need to be used during refurbishment to prevent impacts. The use of site-specific mitigation measures can be implemented during refurbishment to prevent or minimize construction related aquatic impacts from erosion or spills. Such impacts are normally of limited duration and affect only a portion of the aquatic environment. Potential impacts on endangered species cannot be assessed generically and will require analysis in individual plant license renewal cases.

## 2. Aquatic Ecology

The GEIS examined impingement and entrainment; heat shock; cold shock; thermal plume barriers to migration; premature emergence of aquatic insects; stimulation of nuisance organisms; gas supersaturation; low dissolved oxygen in the discharge; accumulation of contaminants in sediment or biota; and losses from predation, parasitism, and disease.

For nuclear power plants using once-through cooling systems, the operational experience of existing plants indicates that many early concerns regarding aquatic resources have not materialized. Neither the published literature nor the responses of regulatory and resource agencies have revealed potential concerns about such early issues as phytoplankton and zooplankton entrainment and premature emergence of aquatic insects in thermal discharges. Although significant localized effects of these stresses have occasionally been demonstrated, the populations' rapid regeneration times and biological compensatory mechanisms apparently are sufficient to preclude long-term or far-field impacts.

On the other hand, some aquatic resources issues warranted further monitoring, and in some cases, mitigative measures to define and correct



adverse impacts. The entrainment and impingement of fish and the discharge of large volumes of heated effluents into small or warm ambient waters were a source of concern at some nuclear power plants. Such issues were examined and resolved through the mechanisms of National Pollution Discharge Elimination System (NPDES) permits and associated FWPCA 316(a) and (b) determinations and were either found to be acceptable or actions were implemented to mitigate the problems. For a few plants, the NPDES process has not been completed and the issues relating to impingement, entrainment, and thermal discharges have not all been resolved. For these plants, there may be unresolved issues relating to intake and discharge effects on fish and shellfish.

Resource agencies are expending major efforts to restore anadromous fish runs, particularly salmon and American shad, through water quality improvements, stocking, and removal of migration barriers. As a result, a number of the agencies have expressed concerns about future impingement and entrainment impacts at plants that operate on certain rivers. These concerns are routinely addressed during the NPDES permit renewal process. Power plants with once-through cooling systems that currently discharge cooling water near the upper temperature limits of their NPDES permits may find compliance with those requirements increasingly difficult if climates change and ambient water temperatures warm in the coming decades. Under these conditions, such plants may need to modify their operations during the warmest months or rely more on helper cooling towers to prevent adverse thermal impacts. Continuing consultation with resource agencies and prompt resolution of NPDES permit issues are expected to ensure that future changes in the environment do not lead to unacceptable impacts on aquatic ecology.

### 3. Groundwater Use and Quality

The GEIS examined groundwater use and quality, groundwater use conflicts including use of Ranney wells, and groundwater quality degradation. The GEIS concluded that groundwater use conflicts and quality degradation may be a problem at certain plants. Groundwater quality at some river sites may be degraded by induced infiltration of poor-quality

river water into an aquifer that supplies large quantities of plant cooling water.

Sites with closed-cycle cooling ponds may degrade groundwater quality. For those plants located inland, the quality of groundwater in the vicinity of ponds must be shown to remain within the State regulatory agency's defined use category.

#### 4. Terrestrial Impacts

The GEIS examined refurbishment impacts, cooling tower impacts on crops and native plants, bird collisions with cooling towers and transmission lines, cooling pond impacts, power line right-of-way management, electromagnetic field effects, effects on floodplains and wetlands, threatened or endangered species, air quality, and land use. Air quality impacts from refurbishment are not expected to lead to significant environmental impact. Salt cooling tower drift at nuclear plants has not been shown to threaten agricultural crops, orchards, or other cultivated plants. No yield reductions from cooling tower operation have been reported for crops except in situations where crops were experimentally placed next to cooling towers. Potential environmental impacts that will require analysis in individual plant license renewal cases would be those which occurred if one or more important terrestrial resources (wetlands, endangered species) would be affected by construction activities associated with refurbishment.

#### 5. Public Health

The GEIS examined radiation exposures to the public, occupational radiation exposures, electromagnetic fields acute effects, electromagnetic fields chronic effects, microbiological organisms, and noise.

The GEIS assessed public health impacts from refurbishment and extended operation, including occupational exposure and doses to the public. The conclusions were that exposures were expected to remain well within regulatory limits, and only slightly above current exposures. The nine plants using cooling ponds, lakes, or canals and the fourteen discharging to small rivers have the potential to influence thermophilic

organisms. Health questions related to public use of affected waters need to be addressed by utilities in these individual plant license renewal cases. The potential for electrical shock induced currents from transmission lines should be reviewed with respect to the National Electric Safety Code (NESC) recommendations.

#### 6. Socioeconomics

The GEIS assessed impacts in the following socioeconomic areas: housing, taxes, public services (excluding transportation), transportation, off-site land use, economic structure, and historic and aesthetic resources. Impacts from refurbishment activities as well as extended operation of nuclear plants were examined. Generic conclusions were reached for taxes, public services excluding transportation, off-site land use, transportation impacts during continued operation, economic structure, and historic and aesthetic resources. These need not be addressed in individual plant license renewals.

Housing impacts during refurbishment could be negative and potentially significant for plants located in areas categorized as "low" population or that have growth control measures to limit housing development. Transportation impacts during refurbishment could also be negative. As a result, only these two issues need to be evaluated as part of individual plant license renewals.

#### 7. Waste Management

The GEIS examined the potential environmental impacts from the generation of various types of wastes during refurbishment and extended operation for an additional 20 years. More specifically, the GEIS examined nonradiological waste, mixed waste, low level radiological waste storage and disposal, spent fuel storage and disposal, and transportation.

The GEIS concluded that license renewal would have only minor impacts on mixed waste and non-radiological waste management activities. For low-level radioactive waste, on-site storage was judged to be adequate as suitable land is available at all plants for interim storage

of additional waste from refurbishment and extended plant operation if disposal sites continue to accept waste in normal increments. The conclusions regarding low-level radioactive waste disposal hinge on the timely implementation of present plans for siting regional compact and individual State disposal sites. If circumstances change and the GEIS assumptions are no longer valid, these impacts would need to be addressed in individual plant license renewals.

The greater volume of spent fuel resulting from an up to 20 more years of operation can be safely accommodated on-site through dry or pool storage at all plants. Radioactive waste transportation impacts were concluded to be of no significant environmental impact.

#### 8. Postulated Accidents

In Chapter 5 of the GEIS, the environmental impacts of postulated accidents were evaluated for the license renewal period. This included severe accidents as well as design basis accidents. For design basis accidents, all plants have had a previous evaluation of their environmental impacts. In addition, the licensees will be required to maintain acceptable design and performance criteria throughout the plant license renewal period. The calculated releases from design basis accidents would not be expected to change. Therefore, it has been concluded that the design of the plants relative to impacts from design basis accidents remains acceptable. Severe accident environmental impacts were not evaluated in the past for all plants. However, since 1981, all plant Final Environmental Statements (FES) have included an analysis of severe accidents. In addition, in the past ten years extensive work on severe accident analysis and safety issue resolution has taken place. Therefore, the severe accident analyses done previously in support of FESs (a total of 27 FESs contain analyses of severe accidents) plus the results of other severe accident analyses done in the past were utilized and extended to predict the severe accident environmental impacts for all plants at the mid-point of their license renewal period. In this assessment the environmental impacts of releases of radioactive materials to the atmosphere and groundwater as well as fallout over land and water were evaluated. In addition, the economic consequences of such accidents

and the need for severe accident mitigation design alternatives (SAMDA) were evaluated.

The GEIS concluded that the environmental impacts of severe accidents during the license renewal period represent a low risk to the population and environment. Although the offsite consequences are potentially large, they are of low likelihood. Because of this, it was further concluded that these impacts need not be considered further in individual plant license renewal applications. In addition, because of this low risk and because of the extensive work looking at safety issues and potential plant improvements already completed or to be completed prior to license renewal, no circumstances were found which would warrant the consideration of SAMDA in individual plant license renewal applications.

#### 9. Decommissioning

The GEIS examined radiation doses, waste management, air quality, water quality, ecological resources, economic impacts, and socioeconomic impacts.

The physical requirements and attendant effects of decommissioning nuclear power plants after a 20-year license renewal period are not expected to be different from those of decommissioning at the end of the current 40-year license period. Decommissioning after a 20-year license renewal period would increase the occupational dose by about 0.5 person-rem and the public dose by a negligible amount. License renewal would not increase the quantity or classification of low-level radioactive waste generated by decommissioning by any appreciable extent. Air and water quality, and ecological impacts of decommissioning would not change as a result of license renewal.

There is considerable uncertainty about the cost of decommissioning. While license renewal would not be expected to change the ultimate cost of decommissioning, it would reduce the present value of the cost. The socioeconomic effects of decommissioning will depend on the magnitude of the decommissioning effort, the size of the community, and other economic activities at the time. However, it is not expected that the impacts would be increased by decommissioning at the end of a 20-year license



renewal period rather than at the end of the current license term. Since a generic conclusion on the acceptability of the incremental impacts of decommissioning can be reached for all plants, impacts on decommissioning need not be evaluated in each individual plant license renewal application.

#### 10. Need for Generating Capacity

Projections of electric power demand to 2030 in each of the 11 Department of Energy regions indicate that there will be a need for the generating capacity represented by license renewal in all 11 regions. The analysis was also extended to individual/utility service areas. From both these viewpoints, the GEIS concluded that license renewal of all nuclear power plants holding OL's in 1992 would be needed to meet the nation's electric power demand.

#### 11. Alternatives to License Renewal

Section 8 of the GEIS established the need for the electric generating capacity represented by the renewal of operating licenses. Section 9 of the GEIS addressed how the demand for this generating capacity could be filled by alternatives to license renewal, and weighed the alternatives against the action of license renewal.

The GEIS concluded that new fossil fuel and nuclear power plants are reasonable alternatives for replacement of retired nuclear capacity because they are proven commercial power-generating technologies, they can provide the baseload capacity currently provided by large nuclear units, and they are available nationwide. However on balance, none of these alternatives offer significant environmental advantages over license renewal. In fact, the action of license renewal would delay or eliminate the environmental impacts associated with the construction of replacement power plants. The principal issues associated with operation of new fossil plants are emissions of pollutants ( $SO_2$  and  $NO_x$  and  $CO_2$ ) which contribute to degradation of air quality, including acid rain and global warming.



License renewal is more advantageous than fossil or new nuclear plants from a cost perspective. The GEIS estimated that the cost savings would be on the order of \$590 million per 1,000 MW(e) plant (discounted to the beginning of the license renewal period) for 20 years of additional operation. However, differences in operating parameters and performance of nuclear plants would influence the actual cost savings for individual plants.

With respect to renewables, the staff finds that wind, solar, hydro, and biomass are not preferred near term alternatives to license renewal because of technological limitations (nonbaseload power sources), availability, and/or economics. The potential exists for small scale regional application of geothermal energy as a replacement for a small fraction of current nuclear baseload capacity.

Therefore, the GEIS concludes, for the nation as a whole, license renewal is preferable to replacement of the generating capacity with a new facility. There is some uncertainty associated with the economic costs of license renewal.

A limited data submission and analysis on costs of refurbishment should accompany each license renewal application. If this data meets threshold criterion on refurbishment costs, no alternatives analysis need accompany the license application. If the submission shows that license renewal cannot meet the threshold criterion, the applicant should submit an alternatives analysis for the alternative of new coal fired generation.

#### C. Regulatory Guidance to Support the 10 CFR Part 51 Revisions

To assure proper implementation of the revised sections of 10 CFR Part 51, the NRC is issuing a draft Regulatory Guide and a draft Environmental Standard Review Plan for license renewal which are being published concurrently with these proposed amendments. The draft guide, identified as Draft Supplement 1.0 to Regulatory Guide 4.2, Revision 1, establishes a uniform format and content acceptable to the staff for structuring and presenting the environmental information to be compiled and submitted by an applicant for a renewed operating license. More specifically, this draft regulatory guide describes the content of

environmental information to be included in license renewal applications, including the criteria to address appropriate Category 2 issues as specified in the proposed Part 51 amendments.

Draft "Environmental Standard Review Plan for License Renewal" (ESRP-LR) provides guidance for the NRC staff when performing Part 51 environmental reviews of applications for renewal of operating licenses. The plan parallels Regulatory Guide 4.2, Supplement 1. The primary purpose of the ESRP-LR is to ensure that these reviews are focused on those environmental concerns associated with license renewal as described in 10 CFR Part 51 and 54. Specifically, it provides guidance to the NRC staff regarding environmental issues that should be reviewed and provides acceptance criteria to help the reviewer evaluate the information submitted as part of the license renewal application. It is also the intent of this plan to make information about the regulatory process available and to improve communication between the NRC, interested members of the public, and the nuclear power industry, thereby increasing understanding of the review process.

#### D. Public Comments on Advance Notice of Proposed Rulemaking

On July 23, 1990, NRC published in the Federal Register an advance notice of proposed rulemaking (ANPR) (55 FR 29964) and a companion notice of intent to prepare a generic environmental impact statement (55 FR 29967). Advice and recommendations on the proposed rulemaking were invited from all interested persons. Comments were requested on nine specific questions. Comments were received from 29 groups and individuals. Two private individuals were both opposed to the rulemaking. Of five citizens groups; one supported, three supported with qualifications, and one opposed the rulemaking. Of the two State agencies responding, one supported the rulemaking and one supported it with qualifications. Three Federal agencies supported the rulemaking with qualifications. All 16 NRC nuclear power plant licensees commenting on the ANPR supported the rulemaking. The one industry group commenting supported the rulemaking. A summary of comments on each question and the staff response follows.

Question No. 1. Is a generic environmental impact statement, or an environmental assessment, required by NEPA to support this proposed rulemaking or can the rulemaking be supported by a technical study?

#### Comments

Strong support for a generic environmental survey rather than a full GEIS to provide the technical basis for the rulemaking was expressed by the Nuclear Management and Resources Council (NUMARC), nuclear utilities, U.S. Department of Energy, and Americans for Nuclear Energy, Inc. The U.S. Environmental Protection Agency and the State of Wisconsin Public Service Commission support development of a comprehensive GEIS. Other comments offered no specific opinion on a GEIS versus a generic environmental survey. Supporters of the generic environmental survey approach state that it is legally acceptable and would be less costly and less subject to delays. Supporters of a comprehensive GEIS believe that it is a feasible approach and a prudent one.

#### NRC Response

The NRC believes that while the generic environmental survey provides an acceptable approach to rulemaking, the GEIS approach is preferable. The purpose of this rulemaking is to resolve as many National Environmental Policy Act (NEPA) issues as possible prior to plant-by-plant license renewal reviews. NRC recognized the possibility that not all NEPA issues would be fully resolvable in the GEIS; however, NRC did not wish to make a priori judgements as to which issues could be resolved generically and which could not. Also, even though some issues may not be fully resolved generically, the analyses performed for the GEIS have helped sharpen and focus the issues that must be addressed in specific license renewal reviews.

Question No. 2. What alternative forms of codifying the findings of the generic environmental impact statement should be considered?

Comments

This question was not specifically addressed by most commenters. The NUMARC recommendation was that the findings of the GEIS be codified by classifying potential environmental impacts of license renewal into four categories which it describes.

NRC Response

The NRC believes that the categories used in the GEIS and the results of the evaluation in Chapter 10 permit codification of findings which is at least as adequate as would result from the NUMARC recommendation. The approach taken here to codifying results of the GEIS is a mix of the 4 approaches identified in the ANPR.

Question No. 3      What activities associated with license renewal will lead to environmental impacts? By what mechanism will they lead to impacts?

Comments

Several respondents addressed this question in a general manner. NUMARC states: "In general, most of the activities associated with license renewal that may have environmental impacts are the same activities considered in environmental evaluations for the initial licenses." Activities associated with license renewal are more fully discussed in a document which NUMARC submitted with its comments. The document is "Study of Generic Environmental Issues Related to License Renewal," dated May 9, 1989. A State agency identified a number of replacement activities which would result in the generation of low-level radioactive waste and doses to workers engaged in these activities.

NRC Response

NUMARC previously submitted a study to NRC in May 1989 in the context of the rulemaking on 10 CFR Part 54, Requirements for Renewal of

Operating Licenses for Nuclear Power Plants. Information on plant modification and operation activities associated with license renewal contained in this document was reviewed by the preparers of the GEIS. Activities associated with license renewal are addressed in the GEIS in Chapter 2 and Appendix B. These encompass the activities identified by the State agency.

Question No. 4      What topical areas should be covered in the generic environmental impact statements? Should the proposed outline be supplemented or restructured?

Comments

Respondents to this question identified priority topics that should be treated in the GEIS and commented on the completeness of the scope of topic. Those addressing the scope of topics generally are satisfied with the list in the ANPR. Most concerns are with the balance of treatment of topics within the outline. NUMARC, supported by member utilities, believes that some topics such as plant modifications associated with the license renewal process and decommissioning are unduly emphasized by being given major section status. A number of respondents discussed topical areas already identified in the ANPR about which they are particularly concerned. Several topics not identified in the ANPR were identified as concerns by one or more respondents. Concern was expressed that the pool of trained nuclear engineers is diminishing. Thus, operators may be less well qualified in the future. A respondent stated that each type of reactor should be treated separately. A Federal agency stated that the GEIS could assess the utilities' efforts for compliance with the Public Utilities Regulatory Policy Act (PURPA) for financial assistance to private co-generation facilities, and that it could also assess the utilities' efforts to comply with State and local conservation efforts.

The State of Wisconsin Public Service Commission raised the following points not explicitly covered in the ANPR. These are that for the need for generating capacity, NRC should defer to determination of need for generating capacity made by the relevant State agency, that an accident which has the potential for leading to a demand by the public



that all reactors be shut down, could jeopardize the supply of electricity, whether management history will it be taken into consideration in a license renewal decision, whether embrittlement of the reactor pressure vessel may result in shutting plants down for susceptibility to pressurized thermal shock soon after extending the license.

#### NRC Response

The NRC believes that the scope of the GEIS accommodates most of the issues of concern raised in the comments. However some issues raised are beyond the scope of the GEIS. The issue of qualification of operators in the future will be assured through NRC regulations, especially 10 CFR Part 55, Operator's Licenses. Relative to the issues of the NRC assessing compliance with PURPA and State and local conservation efforts, the NRC has not explicitly assessed compliance on a utility-by-utility basis nor does it believe it is necessary to do so. Conservation and cogeneration projections are already incorporated in forecasts of need for generating capacity.

Relative to the comment that the NRC should defer to determination of need made by relevant State agencies, the NRC encourages State agencies to review analyses in the GEIS for consistency with their own analyses and to comment where there are significant disagreements. At the time of license renewal application the applicant will be required to submit information on the status of need determinations by any State agency. Relative to the concern that there may be a public demand to shutdown all reactors after a severe accident at one, the NRC assumes in the GEIS that the programs described in Section 5 of the GEIS will maintain a low probability of severe accident and that a shutdown of all reactors is speculative.

Management history is not an issue within the GEIS or proposed rule. Although it will be continually monitored through the operating life of the plant, it will not be a major topic for evaluation in a license renewal review. The embrittlement status of the reactor pressure vessel will be considered for license renewal and may indeed limit the term of a renewed license.



Question No. 5 For each topical area, what are the specific environmental issues that should be addressed?

Comments

NUMARC was the only respondent who specifically addressed this question. Several other respondents did identify specific topics and environmental issues of concern to them. These other responses are addressed under Question No. 4. NUMARC referred NRC to the detailed areas treated in the NUMARC report titled "Study of Generic Environmental Issues Related to License Renewal," dated May 9, 1989, and submitted to NRC in May 1989.

NRC Response

The NUMARC report has been reviewed and was considered in developing the GEIS scope and analyses.

Question No. 6 For each topical area and each specific issue, what information and data are required to perform generic analyses? Where do the information and data exist?

Comments

NUMARC referred to its study submitted to the NRC titled, "Study of Generic Environmental Issues Related to License Renewal," and pointed out that the study contains relevant information and an extensive list of data sources. The U.S. EPA offered to provide information relative to the effect of electromagnetic frequency radiation and on global climate change. The State of Wisconsin Public Service Commission stated that information on need for power and the amount of technically and economically possible conservation and load management exists at each utility and the corresponding State utility commission.

NRC Response

All information in the NUMARC study has been reviewed and used as appropriate in developing the GEIS. NRC has considered EPA information and guidance on effects of electromagnetic frequency radiation and global climate change. A regional generic approach has been taken in the GEIS with required need for power, conservation and load management. NRC believes this is an adequate analysis to establish need for generating capacity for any individual plant but is requesting comment on its analysis.

Question No. 7      For each topical area and each specific issue what criteria should be used to judge the significance of the environmental impact?

Comments

This question was specifically addressed by NUMARC and Yankee Atomic Electric Company. NUMARC provided a more detailed response which was consistent with that provided by Yankee Atomic. A number of general observations were made with regard to significance criteria embodied in NRC practice in the environmental and associated safety areas and in CEQ guidelines. Examples of significance criteria were provided for endangered species, impacts to aquatic biota, and radiological impacts.

NRC Response

These comments generally support the approach to the determination of significance in environmental issues employed in the GEIS.

Question No. 8      For each topical area and each specific issue what is the potential for successful generic analysis?

Comments

NUMARC addressed this question in detail. Commenting utilities stated support for the NUMARC response. The responses of other commenters ranged from a general statement that generic treatment is not

feasible to a general statement that it is feasible. Several commenters each mentioned doubts about the possibility of generic treatment of at least some of the following; need for generating capacity, alternatives, climate change, impacts from refurbishment and continued operation, and severe accidents. NUMARC stated "that nearly all, if not all, of the impacts associated with license renewal have been found amenable to generic analysis." Using the four categories of generic conclusions (see Question No. 2), NUMARC presented conclusions on the categorization of various impacts from plant operation, plant modification, accidents, decommissioning, need for generating capacity and alternative generating capacity.

#### NRC Response

The NRC has considered the positions offered in comments on the potential of generic analysis for each topical area and each specific issue. NRC findings are summarized in Section 10 of the GEIS. NRC believes that the approach taken in the GEIS has resulted in generic conclusions which encompass site and region specific considerations and considers forecasting uncertainties relative to the future.

Question No. 9      What length of extended operating time can reasonably be addressed in the proposed rulemaking? To what extent is it possible to reach generic conclusions about the environmental impacts which would be applicable to plants having renewed operating licenses expiring in the year 2030, 2040 or 2050?

#### Comments

Several commenters had doubts about the accuracy of long term forecasts of need for generating capacity, alternative energy sources, climate change and severe accidents. This question was specifically addressed by NUMARC which pointed out that environmental impact evaluations are performed for new plants for 40 to 50 years into the future, but that unlike new plants, applicants which will apply for plant license

renewal have an operating history with accumulated monitoring data. NUMARC also states that NRC has the option of re-issuing the GEIS at any future time if experience shows an impact which deviates significantly from its predicted value.

#### NRC Response

NRC agrees with NUMARC's observations and believes the conclusions reached in the GEIS on each issue reflect careful consideration of future uncertainties.

#### IV. Questions

Public comment on conclusions regarding potential environmental impacts is being solicited as part of this rulemaking. The Commission will evaluate comments on this notice and the draft GEIS before publishing a final rule.

In addition to general comments on the proposed rulemaking, the Commission is especially interested in public responses to the following questions:

(1) Should the NRC staff have the flexibility to choose to prepare an environmental assessment, instead of a supplemental environmental impact statement, for each plant license renewal proceeding?

(2) For the purposes of presentation of a full discussion of environmental impacts from postulated accidents as required under NEPA:

(a) Is the exposure index (EI) method, as used in Chapter 5 of the GEIS to predict severe accident environmental impacts from atmospheric releases of radioactive material, sufficient to present for consideration the potential impacts from severe accident atmospheric releases for all plants for the license renewal period? If not, what alternative analyses would be acceptable?

(b) Is the method of analysis of radionuclide deposition from fallout from severe accident atmospheric releases over open bodies of water, as used in Chapter 5 of the GEIS, sufficient to present for consideration the impacts of atmospheric fallout for all plants? If not, what alternative analyses would be acceptable?

(c) Is the method of analysis of releases to groundwater from severe accidents, as used in Chapter 5 of the GEIS, sufficient to present for consideration the potential impacts of releases to groundwater for all plants? If not, what alternative analyses would be acceptable?

(3) Is it reasonable to conclude that, based upon the fact that other existing NRC programs have already, or will have prior to license renewal, evaluated severe accidents on a plant specific basis, SAMDAs need not be considered in individual license renewal applications? If not, what alternative analyses would be acceptable?

(4) What significant environmental issues have not been evaluated in the GEIS?

(5) Which evaluations presented are not sufficient for drawing generic conclusions?

(6) What additional analyses can be done to further address the Category 2 and 3 items? For example, could criteria be developed to change local transportation during refurbishment and threatened and endangered species to Category 2 items? Are the criteria for meeting the defined bounding conditions for Category 2 items sufficiently clear?

(7) The GEIS and this proposed action apply to all plants currently holding an OL or CP, except for WNP 1 and 3, Grand Gulf 2, and Perry Unit 2. Should these plants be included in the scope of this action?

#### V. Availability of Documents

A free single copy of each of these documents, to the extent of supply, may be requested by those considering providing comment by writing to the U.S. Nuclear Regulatory Commission, ATTN: Distribution Section, Washington, DC 20555

The principal supporting documents of this supplementary information are as follows:

- (1) Draft Generic Environmental Impact Statement, NUREG-1437
- (2) Regulatory Analysis: Proposed Part 51 Amendments
- (3) Supplement to Regulatory Guide 4.2
- (4) Environmental Standard Review Plan-License Renewal, NUREG-1429

Copies of all documents cited in this supplementary information are available for inspection and/or for copying for a fee, in the NRC public document room, 2120 L St. NW. (lower level) Washington, DC.

In addition, copies of NUREGs cited here may be purchased from the Superintendent of Documents, U.S. Government Printing Office, PO Box 37082, Washington, DC 20013-7082. Copies are also available for purchase from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA, 22161

#### VI. Environmental Impact

The NRC has determined that this proposed regulation is the type of action described in categorical exclusion 10 CFR 51.22(c)(3). Therefore neither an environmental impact statement nor an environmental assessment has been prepared for this proposed regulation. This action is procedural in nature in that it pertains to the type of environmental information to be reviewed. However, since this action does make a generic determination regarding certain environmental impacts associated with license renewal, a Generic Environmental Impact Statement has been prepared in support of license renewal.

#### VII. Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule has been submitted to the Office of Management and Budget for review and approval of the paperwork requirements. Public reporting burden for this collection of information is estimated to average 1,000 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This is twenty-five percent of the estimated burden under existing Part 51. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch (P-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the



Paperwork Reduction Project (3150-), Office of Management and Budget, Washington, DC 20503.

#### VIII. Regulatory Analysis

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The two alternatives considered were (a) retaining the present Part 51 review process for license renewal, where all review would be done on a plant specific basis, and (b) amending Part 51 to allow a portion of the environmental review to be conducted on a generic basis. The conclusions of the draft regulatory analysis show substantial cost savings of alternative (b) over alternative (a).

The draft analysis is available for inspection in the NRC Public Document Room, 2120 L Street, N.W. (Lower Level), Washington, DC. Copies of the analysis are available as described in Section V. The Commission requests public comment on the draft regulatory analysis. Comments on the draft analysis may be submitted to the NRC as indicated under the addresses heading.

#### IX. Regulatory Flexibility Act

The proposed rule will not have a significant impact on a substantial number of small entities. The proposed rule sets forth application procedures and environmental information to be submitted by nuclear power reactor licensees to facilitate NRC's obligations under NEPA. Nuclear power plant licensees do not fall within the definition of small businesses as defined in Section 3 of the Small Business Act, 15 U.S.C. 632, the Small Business Size Standards of the Small Business Administrator (13 CFR Part 121), or the Commission's size Standards (50 Fr 50241; December 9, 1985).

#### X. Non-Applicability of Backfit Rule

This rule addresses the procedural and technical requirements for obtaining a renewed operating license for nuclear power plants. The Commission has not previously addressed the policy, technical and procedural issues relevant to renewal of nuclear power plant operating licenses either in rulemaking or in guidance documents. Accordingly, this rule does not constitute a "backfit" as defined in 10 CFR 50.109(a)(1) and a backfit analysis need not be prepared. Moreover, policy considerations weigh against consideration of Part 51 and amendments as a "backfit." The primary impetus for the Backfit Rule was "regulatory stability," *viz.*, that once the Commission decides to issue a license, the terms and conditions for operating under that license would not be arbitrarily changed *post hoc*. Regulatory stability is not a relevant issue with respect to Part 51 amendments. This rule has only a prospective effect upon nuclear power plant licensees. There are no licensees currently holding renewed nuclear power plant operating licenses who could be affected by this rule; consequently, there are no valid expectations that may be changed regarding the terms and conditions for obtaining a renewed operating license.

As the Commission has previously expressed in the statement of Considerations for 10 CFR Part 52, which prospectively changed the requirements for receiving design certifications, the backfit rule:

"was not intended to apply to every regulatory action which changes settled expectations. Clearly, the backfit rule would not apply to a rule which imposed more stringent requirements on all future applicants for construction permits, even though such a rule might arguably have an adverse impact on a person who was considering applying for a permit but had not done so yet. In this latter case, the backfit rule protects the construction permit holder, but not the prospective applicant, or even the present applicant" ( 54 FR 15385-86; April 18, 1989.)

List of Subjects in 10 CFR Part 51

Administrative practice and procedure, Environmental impact statement, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, the National Environmental Policy Act of 1969, as amended, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR Part 51.

PART 51 - ENVIRONMENTAL PROTECTION REGULATIONS FOR DOMESTIC  
LICENSING AND RELATED REGULATORY FUNCTIONS

1. The authority citation for Part 51 continues to read as follows:

AUTHORITY: Sec. 161, 68 Stat. 948, as amended (42 U.S.C. 2201); secs. 201, as amended, 202, 88 Stat. 1242, as amended, 1244 (42 U.S.C. 5841, 5842).

Subpart A also issued under National Environmental Policy Act of 1969, secs. 102, 104, 105, 83 Stat. 853-854, as amended (42 U.S.C. 4332, 4334, 4335); and Pub. L. 95-604, Title II, 92 Stat. 3033-3041. Sections 51.20, 51.30, 51.60, 51.61, 51.80, and 51.97 also issued under secs. 135, 141, Pub. L. 97-425, 96 Stat. 2232, 2241, and sec. 148, Pub. L. 100-203, 101 Stat. 1330-223 (42

U.S.C. 10155, 10161, 10166). Section 51.22 also issued under sec. 275, 73 Stat. 688, as amended by 92 Stat. 3036-3038 (42 U.S.C. 2021) and under Nuclear Waste Policy Act of 1982, sec. 121, 96 Stat. 2228 (42 U.S.C. 10141). Sections 51.43, 51.67, and 51.109 also issued under Nuclear Waste Policy Act of 1982, sec. 114(f), 96 Stat. 2216, as amended (42 U.S.C. 10134(f)).

2. Section 51.20 is amended by revising paragraph (b) (2) to read as follows:

§51.20 criteria for and identification of licensing and regulatory actions requiring environmental impact statements.

\* \* \* \* \*

(b) \* \* \*

(2) Issuance of a full power or design capacity license to operate a nuclear power reactor pursuant to Part 50 of this chapter. Issuance or renewal of a license to operate a testing facility, or fuel reprocessing plant pursuant to Part 50 of this chapter.

\* \* \* \* \*

3. Section 51.53 is revised to read as follows:

§51.53 Supplement to Environmental Report

(a) General. Any supplement to an applicant's environmental report prepared under the provisions of this section may incorporate by reference any information contained in

a prior environmental report or supplement thereto which relates to the same production or utilization facility or any information contained in a final environmental document previously prepared by the NRC staff which relates to the same production or utilization facility. Documents which may be referenced include, but are not limited to, final environmental impact statement, supplement to final environmental impact statement, environmental assessment and record of decision prepared in connection with the construction permit, operating license and any license amendment for that facility.

(b) Operating license stage

Each applicant for a license to operate a production or utilization facility covered by §51.20 shall submit with its application the number of copies, as specified in §51.55, of a separate document, entitled "Supplement to Applicant's Environmental Report-Operating License Stage," which will update "Applicant's Environmental Report-Construction Permit Stage". Unless otherwise required by the Commission, the applicant for an operating license for a nuclear power reactor shall submit this report only in connection with the first licensing action authorizing full power operation. In this report, the applicant shall discuss the same matters described in §§51.45, 51.51, and 51.52, but only to the extent that they differ from those discussed or reflect new information in addition to that discussed in the final environmental impact statement prepared by

the Commission in connection with the construction permit. Unless otherwise required by the Commission, no discussion of need for power or alternative energy sources or alternative sites for the facility or of any aspect of the storage of spent fuel for the facility within the scope of the generic determination in §51.23(a) and in accordance with §51.23(b) is required in this report.

4. Section 51.53 is revised by adding §51.53(c) to read as follows:

(c) Operating license renewal stage

(1) Each applicant for renewal of a license to operate a nuclear power reactor under Part 54 of this chapter, shall submit with its application the number of copies, as specified in §51.55, of a separate document, entitled "Supplement to Applicant's Environmental Report-Operating License Renewal Stage."

(2) The supplemental report shall contain a description of the proposed action, including the applicant's plans for modification to the facility or its administrative control procedures as described in accord with §54.21(e) of this chapter. Modifications affecting plant effluents that affect the environment must be described in detail.

(3) For those applicants seeking an initial renewal license and holding an operating license as of June 30, 1992, the scope



of issues to be addressed in the supplemental report will be limited to the following:

(i) For those issues identified as Category 3 in Appendix B of this part the supplemental report must contain an assessment regarding:

(A) The impact of the individual nuclear power reactor license renewal on threatened or endangered species.

(B) The impact of the individual nuclear power reactor license renewal on local traffic conditions during periods of license-renewal-related refurbishment activities.

(ii) For those issues identified as Category 2 in Appendix B of this part the supplemental report must contain a finding that:

(A) The nuclear power reactor uses only cooling towers for primary condenser cooling or that the license renewal applicant holds current Clean Water Act 316 (a) and (b) determinations pursuant to 40 CFR Part 125, or equivalent State permits. If no such finding can be made, an assessment of the impact of the individual nuclear power reactor license renewal on fish and shellfish resources resulting from heat shock [Clean Water Act 316(a)] and impingement and entrainment [Clean Water Act 316(b)] must be provided.

(B) The nuclear power reactor is not located at an inland site or does not have cooling ponds. If no such finding can be made, an assessment of the impact of the individual nuclear power reactor license renewal on groundwater quality must be provided.

(C) The nuclear power reactor does not use Ranney wells and either does not pump 100 or more gallons per minute of groundwater or does not have private wells located within the cones of depression of the nuclear power reactor wells. If no such finding can be made, an assessment of the impact of the individual nuclear power reactor license renewal on groundwater use conflicts must be provided.

(D) Construction activities that are to be undertaken involving additional on-site land use will not affect important plant and animal habitats. If no such finding can be made, an assessment of the impact of the individual plant license renewal on important plant and animal habitats must be provided.

(E) No major construction activities associated with the individual nuclear power reactor license renewal will occur at the site. If no such finding can be made, a construction impact control program that will mitigate potential impacts on the aquatic environment from soil erosion or spills must be implemented and a description of such program must be provided.

(F) The nuclear power reactor is in a medium or high population area<sup>1</sup> and not in an area where growth control measures that limit housing development are in effect. If no such finding can be made, an assessment of the impact of the individual nuclear power reactor license renewal on housing availability must be provided.

(G) The design of the transmission lines of the nuclear power reactor meets the National Electric Safety Code recommendations regarding the prevention of electric shock from induced currents. If no such finding can be made, an assessment of the impact of the individual nuclear power reactor license renewal on the potential electric shock hazard from the transmission lines of the plant must be provided.

(H) The nuclear power reactor does not use a cooling pond, lake, or canal or does not discharge water to a small river. If no such finding can be made, an assessment of the impact of thermophilic organisms on the health of recreational users of affected water must be provided.

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<sup>1</sup> An area is considered to have a medium or high population if any one of the following conditions is satisfied:

- (a) the plant is within 20 miles of a city of 25,000;
- (b) the plant is within 50 miles of a city of 100,000;
- (c) the population of the area within 20 miles of the plant is 75,000 or more;
- (d) the population of the area within 50 miles of the plant is 1,500,000 or more; or
- (e) the population of the area within 20 miles of the plant is 50,000 or more and within 50 miles of the plant the population is 400,000 or more.

(I) The nuclear power reactor will have access to a low-level radioactive waste disposal facility through a low-level waste compact or an unaffiliated state. If no such finding can be made, a presentation of capability and plans for interim waste storage must be provided with an assessment of potential ecological habitat distinction due to construction activities.

(J) Replacement of equivalent generating capacity by a coal-fired plant, has no demonstrated cost advantage<sup>2</sup> over the individual nuclear power reactor license renewal. If no such finding can be made, a justification for choosing the license renewal alternative must be provided. In addition, for nuclear power reactors located in California, Oregon, Washington, and Arizona geothermal generating capacity as an alternative to license renewal must be assessed.

(iii) Unless otherwise required by the Commission, no discussion of license renewal issues identified as Category 1 issues in Appendix B of subpart A of this Part is required in the supplemental report.

(4) The supplemental report must contain an analysis of whether the assessment required by paragraph (c)(3)(i)-(ii) of this section change the findings documented in Table B-1 that the

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<sup>2</sup>In performing the cost demonstration, costs of refurbishment and construction, fuel, operation and maintenance and decommissioning must be considered.

renewal of any operating license for up to 20 years will have accrued benefits that outweigh the economic, environmental and social costs of license renewal.

(d) Post operating license stage. Each applicant for a license amendment authorizing the decommissioning of a production or utilization facility covered by §51.20 and each applicant for a license or license amendment to store spent fuel at a nuclear power reactor after expiration of the operating license for the nuclear power reactor shall submit with its application the number of copies, as specified in §51.55, of a separate document, entitled "Supplement to Applicant's Environmental Report--Post Operating License Stage," which will update "Supplement to Applicant's Environmental Report--Operating License Stage," and "Supplement to Applicant's Environmental Report--Operating License Renewal Stage," as appropriate, to reflect any new information or significant environmental change associated with the applicant's proposed decommissioning activities or with the applicant's proposed activities with respect to the planned storage of spent fuel. Unless otherwise required by the Commission, in accordance with the generic determination in §51.23(a) and the provisions in §51.23(b), the applicant shall only address the environmental impact of spent fuel storage for the term of the license applied for.

4. In §51.55, paragraph (a) is revised to read as follows:

§ 51.55 Environmental report--number of copies; distribution.

(a) Each applicant for a license to construct and operate a production or utilization facility covered by paragraphs (b)(1), (b)(2), (b)(3) or (b)(4) of § 51.20, each applicant for renewal of an operating license for a nuclear power reactor, each applicant for a license amendment authorizing the decommissioning of a production or utilization facility covered by § 51.20, and each applicant for a license or license amendment to store spent fuel at a nuclear power reactor after expiration of the operating license for the nuclear power reactor shall submit to the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, forty-one (41) copies of an environmental report, or any supplement to an environmental report. The applicant shall retain an additional 109 copies of the environmental report or any supplement to the environmental report for distribution to parties and Boards in the NRC proceeding, Federal, State, and local officials and any affected Indian tribes, in accordance with written instructions issued by the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate.

\* \* \* \* \*

5. Section 51.95 is revised to read as follows:

§ 51.95 Supplement to final environmental impact statement; environmental assessment.



(a) General. Any supplement to a final environmental impact statement or any environmental assessment prepared under the provisions of this section may incorporate by reference any information contained in a final environmental document previously prepared by the NRC staff which relates to the same production or utilization facility. Documents which may be referenced include, but are not limited to, final environmental impact statement, supplement to final environmental impact statement, environmental assessment and record of decision prepared in connection with the construction permit, operating license and any license amendment for that facility. A supplement to a final environmental impact statement will include a request for comments as provided in §51.73.

(b) Operating license stage. In connection with the issuance of an operating license for a production or utilization facility, the NRC staff will prepare a supplement to the final environmental impact statement on the construction permit for that facility, which will update the prior environmental review. The supplement will only cover matters which differ from, or which reflect significant new information concerning matters discussed in the final environmental impact statement. Unless otherwise determined by the Commission, a supplement on the operation of a nuclear power reactor will not include discussion of need for power or alternative energy sources or alternative sites or of any aspect of the storage of spent fuel for the

nuclear power reactor within the scope of the generic determination in §51.23(a) and in accordance with §51.23(b), and will only be prepared in connection with the first licensing action authorizing full power operation.

(c) Operating license renewal stage. In connection with the renewal of an operating license for a nuclear power reactor under Part 54 of this chapter the NRC staff will prepare an environmental assessment, or if warranted a supplemental environmental impact statement. Unless otherwise required by the Commission, the supplemental environmental impact statement or the environmental assessment shall only address the matters in §51.53(c) of this part. A supplemental environmental impact statement is required if significant impacts are found.

(d) Post operating license stage. In connection with the amendment of an operating license to authorize the decommissioning of a production or utilization facility covered by §51.20 or with the issuance, amendment or renewal of a license to store spent fuel at a nuclear power reactor after expiration of the operating license for the nuclear power reactor, the NRC staff will prepare a supplemental environmental impact statement for the post operating license stage or an environmental assessment, as appropriate, which will update the prior environmental review. Unless otherwise required by the Commission, in accordance with the generic determination in §51.23(a) and the provisions of §51.23(b), a supplemental

environmental impact statement for the post operating license stage or an environmental assessment, as appropriate, will address the environmental impacts of spent fuel storage only for the term of the license, license amendment or license renewal applied for.

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6. A new Appendix B is added to subpart A of 10 CFR to read as follows:

APPENDIX B TO SUBPART A - ENVIRONMENTAL EFFECT OF RENEWING THE OPERATING LICENSE OF A NUCLEAR POWER REACTOR

The Commission has considered the environmental and other costs and benefits of alternatives to granting a renewed operating license to individual nuclear power reactor holding an operating license as of June 30, 1992. The Commission has found that the renewal of any operating license for up to 20 years will have accrued benefits that outweigh the economic environmental and social costs of license renewal, subject to an evaluation of, the impact of those issues identified as Category 2 (only for those plants that are outside the envelope defined in each issue) and 3 in Table B-1. Table B-1 summarizes the Commission findings on the scope and magnitude of environmental and other effects of renewing the operating license of an individual nuclear power plant as required under section 102(2) of the National Environmental Policy Act of 1969 as amended. The Commission will review the material in this appendix every five years and update it if necessary.

TABLE B-1. Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Reactors

Issue	Category <sup>1</sup>	Findings <sup>2</sup>
<b>PART I. NEED FOR GENERATING CAPACITY</b>		
Need for generating capacity via license renewal	1	LARGE BENEFIT. License renewal of an individual nuclear power reactor will be needed to meet generating capacity requirements in the service area and to avoid constructing and operating new generating facilities which would otherwise be necessary to replace the retired nuclear reactor.
<b>PART II. IMPACTS OF ALTERNATIVES</b>		
Advantages of alternatives to license renewal	1	NO ADVANTAGE. License renewal of an individual nuclear power reactor is found to be preferable to replacement of the generating capacity with a new facility to the year 2020. License renewal is found to be preferable, both environmentally and economically <sup>3</sup> to either new fossil fueled or new nuclear capacity. These areas are in the states of California, Oregon, Washington, and Arizona. Wind, solar photovoltaic cells, solar thermal power, hydropower, and biomass are found to be not preferable to license renewal because of technological limitations, availability, and economics. Geothermal could be competitive in areas where geothermal resources are readily available.
<b>PART III. BENEFITS/COST ASSESSMENT</b>		
<b>BENEFITS</b>		
<b>Direct Economic</b>		
Generating Capacity	1	LARGE BENEFIT. Will provide from $72 \times 10^3$ to $1270 \times 10^3$ net kW(e) reflecting the smallest to the largest reactor.
Electric energy	1	LARGE BENEFIT. Will provide from $391 \times 10^6$ to $6898 \times 10^6$ kWh/yr reflecting the smallest to the largest reactor.
Avoided costs	2 <sup>3</sup>	LARGE BENEFIT. Will save an estimated \$590 million in 1989 dollars discounted to the beginning of operation for 20 years of license renewal, per 1000 MW(e) reactor compared to a new coal reactor of the same capacity. An estimated \$108 million of this saving is attributed to delaying decommissioning by 20 years.

## Indirect

Local taxes			
Refurbishment	1		SMALL BENEFIT. Tax revenues will increase due to capital improvements.
Renewal term	1		SMALL BENEFIT. The impact of tax revenues may vary from small to large depending on the total tax base of the taxing jurisdictions.
Employment			
Refurbishment	1		SMALL BENEFIT. Impacts on regional employment will be small to moderate depending on the total employment base of the region.
Renewal term	1		SMALL BENEFIT. Impacts on regional employment will be small to large depending on the total employment base of the region.

## COSTS

Direct economic<sup>3</sup>

Refurbishment	2		MODERATE COST. Upper bound refurbishment costs are estimated at \$636 per kW(e) in 1989 dollars. Costs include allowance for labor, capital, replacement energy, and allowance for funds used during construction.
Fuel	2		SMALL COST. 6.1 mills per kWh in levelized 1989 dollars
Operation and maintenance	2		MODERATE COST. 20.2 mills per kWh in levelized 1989 dollars



Environmental and Socioeconomic  
Surface Water Quality, Hydrology, and Use  
(for all reactors)

Effects of refurbishment on surface water quality	2	SMALL COST. Impacts are expected to be minor and insignificant during refurbishment if there are no major construction activities associated with the individual reactor license renewal or if Best Management Practices (BMPs) are employed to control soil erosion and spills; applicant must provide evidence of approved BMPs in license renewal application.
Effects of refurbishment on surface water use	1	SMALL COST. Water use during refurbishment will not change or will be reduced during reactor outage.
Altered current patterns at intake and discharge structures	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Altered salinity gradients	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Altered thermal stratification of lakes	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Temperature effects on sediment transport capacity	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Scouring due to discharged cooling water	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Eutrophication	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Discharge of chlorine or other biocides	1	SMALL COST. Effects are readily controlled through National Pollution Discharge Elimination System (NPDES) permit and periodic modifications, if needed, and is not expected to be a problem during the license renewal term.
Discharge of sanitary wastes	1	SMALL COST. Effects are readily controlled through NPDES permit and periodic modifications, if needed, and is not expected to be a problem during the license renewal term.

Draft Rule

[7590-01]

Discharge of other chemical contaminants (e.g., metals)	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors with cooling-tower-based heat dissipation systems. Has been satisfactorily mitigated at other reactors. It is not expected to be a problem during the license renewal term.
Water use conflicts	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors with once-through heat dissipation systems. The issue has been a concern at two nuclear power reactors with cooling ponds and at two reactors with cooling towers, but it will be resolved with appropriate state or regional regulatory agencies outside of NRC license renewal actions. It is not expected to be a problem during the license renewal term.
<p style="text-align: center;"><b>Aquatic Ecology (for all reactors)</b></p>		
Refurbishment	1	SMALL COST. During reactor shutdown and refurbishment there will be negligible effects on aquatic biota due to a reduction of entrainment and impingement of organisms or reduced release of chemicals.
Accumulation of contaminants in sediments or biota	1	SMALL COST. Has been a concern at a single nuclear power reactor with a cooling pond, but has been satisfactorily mitigated. Has not been demonstrated to be a problem at operating nuclear power reactors with cooling towers or once-through cooling systems, or a cooling pond, except for one reactor. It was successfully mitigated at that reactor. It is not expected to be a problem during the license renewal term.
Entrainment of phytoplankton and zooplankton	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Cold shock	1	SMALL COST. Has been satisfactorily mitigated at operating nuclear reactors with once-through cooling systems and has not endangered fish population. Has not been demonstrated to be a problem at operating nuclear power reactors with cooling towers or cooling ponds. It is not expected to be a problem during the license renewal term.
Thermal plume barrier to migrating fish	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.

Draft Rule

[7590-01]

Premature emergence of aquatic insects	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Gas supersaturation (gas bubble disease)	1	SMALL COST. Previously a concern at a small number of operating nuclear power reactors with once-through cooling systems, but has been satisfactorily mitigated. Has not been demonstrated to be a problem at operating nuclear power reactors with cooling towers or cooling ponds. It is not expected to be a problem during the license renewal term.
Low dissolved oxygen in the discharge	1	SMALL COST. Has been a minor concern at one nuclear power reactor with a once-through cooling system, but issue will be monitored in the NPDES permit renewal process. Has not been demonstrated to be a problem at operating nuclear power reactors with cooling towers or cooling ponds. It is not expected to be a problem during the license renewal term.
Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Stimulation of nuisance organisms (e.g., shipworms)	1	SMALL COST. Has been satisfactorily mitigated at the single nuclear power reactor with a once-through cooling system where it was a problem. Has not been demonstrated to be a problem at operating nuclear power reactors with cooling towers or cooling ponds. It is not expected to be a problem during the license renewal term.

**Aquatic Ecology**

**(for reactors with once-through heat dissipation systems)**

Entrainment of fish and shellfish early life stages	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Licensees of reactors that do not have an approved Clean Water Act 316(b) determination or equivalent state permit at the time of license renewal application must evaluate the entrainment issue in the license renewal application.
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**Draft Rule**

[7590-01]

Impingement of fish and shellfish	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Licensees, of reactors that do not have an approved Clean Water Act 316(b) determination or equivalent state permit if required at the time of license renewal application must evaluate the impingement issue in the license renewal application.
Heat shock	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected the problem during license renewal term. Licensees of reactors that do not have an approved Clean Water Act 316(a) determination or equivalent state permit, if required, at the time of license renewal application must evaluate the heat shock issue in the license renewal application.

**Aquatic Ecology**

(for reactors with cooling-tower-based heat dissipation systems)

Entrainment of fish and shellfish early life stages	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors with this type of cooling system and is not expected to be a problem during the license renewal term.
Impingement of fish and shellfish	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors with this type of cooling system and is not expected to be a problem during the license renewal term.
Heat shock	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors with this type of cooling system and is not expected to be a problem during the license renewal term.

**Aquatic Ecology**

(for reactors with cooling pond heat dissipation systems)

Impingement of fish	2	SMALL COSTS. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Licensees of reactors that do not have an approved Clean Water Act 316(b) determination or equivalent state permit at the time of license renewal application must evaluate the impingement issue in the license renewal application.
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Entrainment of fish early life stages	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Licensees of reactors that do not have an approved Clean Water Act 316(b) determination or equivalent state permit at the time of license renewal application must evaluate the entrainment issue in the license renewal application.
Heat shock	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Licensees of reactors that do not have an approved Clean Water Act 316(a) determination or equivalent state permit, if required at the time of license renewal application must evaluate the heat shock issue in the license renewal application.

#### Groundwater Use and Quality, Impacts of Refurbishment

Groundwater use and quality	1	SMALL COST. Extensive dewatering during the original construction on some sites will not be repeated during refurbishment on any sites. Any reactor wastes produced during refurbishment will be handled in the same manner as in current operating practices and is not expected to be a problem during the license renewal term.
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#### Groundwater Use and Quality, Impacts of Operation

Groundwater use conflicts (potable and service water)	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Reactors pumping 100 or more gpm <u>and</u> having private wells located within cones of depression of reactor wells are required to assess for use conflict during the license renewal term.
Groundwater use conflicts (water pumped for dewatering)	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. Reactors pumping 100 or more gpm <u>and</u> having private wells located within cones of depression of reactor wells are required to assess for use conflict during the license renewal term.

Groundwater use conflicts (Surface water used as make-up water—potentially affecting aquifer recharge)	1	SMALL COST. Water use conflicts are small and will be resolved as necessary through surface water regulatory mechanism outside of NRC license renewal process and is not expected to be a problem for any reactor during the license renewal term.
Groundwater use conflicts (Ranney wells)	2	SMALL COST. Ranney wells can result in potential groundwater depression beyond site boundary. Impacts of large groundwater withdrawal for cooling tower makeup at nuclear power reactors using Ranney wells must be evaluated at the time of application for license renewal.
Groundwater quality degradation (Ranney wells)	1	SMALL COST. Groundwater quality at river sites may be degraded by induced infiltration of poor-quality river water into an aquifer that supplies large quantities of reactor cooling water. However, the lower quality infiltrating water would not preclude the current uses of groundwater and is not expected to be a problem during the license renewal term.
Groundwater quality degradation (saltwater intrusion)	1	SMALL COST. Nuclear power reactors do not contribute significantly to saltwater intrusion.
Groundwater quality degradation (cooling ponds)	2	SMALL COST. Sites with closed-cycle cooling ponds may degrade groundwater quality. This is not an issue for those reactors located in salt marshes. However, for those reactors located inland, the quality of the groundwater in the vicinity of the ponds must be shown to be adequate to allow continuation of current uses.

#### Terrestrial Resources

Refurbishment impacts	2	SMALL COST. Insignificant impact if no loss of important reactor and animal habitat occurs. If important reactor and animal habitats are affected the potential impact will be assessed at the time of license renewal.
Cooling tower impacts on crops	1	SMALL COST. Salt drift, icing, fogging, or increased humidity associated with cooling tower operation have not been found to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Cooling tower impacts on native plants	1	SMALL COST. Salt drift, icing, fogging, or increased humidity associated with cooling tower operation have not been found to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.



Draft Rule

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Bird collisions with cooling towers	1	SMALL COST. Has not been found to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Cooling pond impacts on terrestrial resources	1	SMALL COST. No significant damage to vegetation has been observed as a result of fogging, icing, or increased relative humidity at nuclear reactor cooling ponds. The low levels of water contaminants in cooling ponds are not a threat to wildlife using the ponds. No significant impact is expected at any nuclear power reactor during the license renewal term.
Power line right-of-way management (cutting and herbicide application)	1	SMALL COST. Periodic vegetation control causes cyclic changes in the density of wildlife populations dependent on the right-of-way, but long-term densities appear relatively stable. Numerous studies show neither significant positive nor negative effects of power line rights-of-way on wildlife. No significant impact is expected at any nuclear power reactor during the license renewal term.
Bird collisions with power lines	1	SMALL COST. Has not been demonstrated to be a problem at operating nuclear power reactors and is not expected to be a problem during the license renewal term.
Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)	1	SMALL COST. No significant impacts of electromagnetic fields on terrestrial flora and fauna have been identified and is not expected to be a problem during the license renewal term.
Floodplains and wetlands on power line right-of-way	1	SMALL COST. Periodic vegetation control is necessary in forested wetlands underneath power lines and can be achieved with minimal damage to the wetland. On rare occasions when heavy equipment may need to enter a wetland to repair a power line, impacts can be minimized through the use of standard practices. No significant impact is expected at any nuclear power reactor during the license renewal term.

**Threatened or Endangered Species  
(for all reactors)**

Threatened or endangered species	3	Generally, reactor refurbishment and continued operation is not expected to adversely affect threatened or endangered species. However, consultation with appropriate agencies must occur to determine if, in fact, threatened or endangered species are present and if they will be adversely affected.
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**Air Quality**

Air Quality	1	SMALL COST. Air quality impacts from reactor refurbishment associated with license renewal are expected to be small.
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**Land Use**

On-site land use	1	SMALL COST. Projected on-site land use changes required during refurbishment and the renewal period would be a small fraction of any nuclear power reactor site.
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**Human Health, Impacts of Refurbishment**

Radiation exposures to the public	1	SMALL COST. During refurbishment, the gaseous effluents would result in doses well below the natural background dose. Applicable regulatory dose limits to the public are not expected to be exceeded.
Occupational radiation exposures	1	SMALL COST. Average occupational doses from refurbishment are expected to be within the range of annual average doses experienced for pressurized-water reactors and boiling-water reactors. Upper-limit cancer and genetic risks from radiation exposure from such doses are much less than 1% of the risk from the natural background doses.

**Human Health, Impacts of Operation During License Renewal**

Microbiological organisms (occupational health)	1	SMALL COST. Occupational health questions are expected to be resolved using industrial hygiene principles to minimize worker exposures.
Microbiological organisms (public health)	2	SMALL COST. Has not been demonstrated to be a problem at most operating reactors and is not expected to be a problem during the license renewal term. At the time of license renewal of reactors using cooling ponds, lakes, or canals and reactors discharging to small rivers applicants will assess the impact of thermophilic organisms on the health of recreational users of affected water.

Draft Rule

[7590-01]

Noise	1	SMALL COST. Has not been demonstrated to be a problem at operating reactors and is not expected to be a problem at any reactor during the license renewal term.
Electromagnetic fields, acute effects (electric shock)	2	SMALL COST. Has not been demonstrated to be problem at most operating reactor and is not expected to be a problem during the license renewal term. If it cannot be demonstrated at the time of license renewal that the transmission lines of the reactor meets the National Electric Safety Code recommendations regarding the prevention of shock from induced currents then an assessment of the potential electric shock hazard from the transmission lines of the reactor must be provided.
Electromagnetic fields, chronic effects	1	SMALL COST. Biological and physical studies of 60-Hz electromagnetic fields have not demonstrated consistent evidence linking harmful effects with field exposures.
Radiation exposures to public	1	SMALL COST. Present radiation doses to the public are very small with respect to natural background radiation; these levels are in decline. These doses are not expected to be a problem during the license renewal term.
Occupational radiation exposures	1	SMALL COST. Projected maximum occupational doses during the license renewal term are within the range of doses experienced and are considerably below the 5 rem exposure limit.

Socioeconomics

Housing impacts of refurbishment	2	SMALL COST. Not expected to be a problem at any reactor located in a medium or high population area <sup>4</sup> and not in an area where growth control measures that limit housing development are in effect. Housing impacts of the workforce associated with refurbishment will be assessed at the time of license renewal for reactors located in sparsely populated areas or in areas with growth control measures that limit housing development.
Housing impacts of license renewal term	2	SMALL COST. Not expected to be a problem at any reactor located in a medium or high population area <sup>4</sup> and not in an area where growth control measures that limit housing development are in effect. Housing impacts of the workforce associated with refueling/maintenance outages will be assessed at the time of license renewal for reactors located in sparsely populated areas or in areas with growth control measures that limit housing development.

Draft Rule

[7590-01]

Public service impacts of refurbishment	1	SMALL COST. Refurbishment induced population growth will be small and will not strain local infrastructure at any reactor.
Transportation impacts of refurbishment	3	Impacts are generally expected to be small, however, they must be assessed for each reactor to consider the increase in traffic associated with the additional workers and the local road and traffic control conditions.
Public service (including transportation) impacts during license renewal term	1	SMALL COST. No significant impacts are expected during the license renewal term.
Offsite land use impacts of refurbishment	1	SMALL COST. Impacts will not be significant at any reactor because plant-induced population growth will have little effect on land use patterns.
Offsite land use impacts of license renewal term	1	SMALL COST. Changes in land use would be associated with population and tax revenue changes resulting from license renewal of a reactor. These changes are expected to be small for all plants.
Historic resources impacts of refurbishment	1	SMALL COST. No significant impacts are expected during refurbishment.
Historic resources impacts of license renewal term (transmission lines)	1	SMALL COST. No significant impacts are expected during the license renewal term.
Historic resources impacts of license renewal term (normal operations)	1	SMALL COST. No significant impacts are expected during the license renewal term.
Aesthetic impacts of refurbishment	1	SMALL COST. No significant impacts are expected during refurbishment.
Aesthetic impacts of license renewal term	1	SMALL COST. Impacts will be small to moderate depending on the visual intrusiveness of the reactor on historic and aesthetic resources in the area.
Aesthetic impacts of license renewal term (transmission lines)	1	SMALL COST. No significant impacts are expected during the license renewal term.

## Environmental Impacts of Postulated Accidents

Design basis accidents	1	SMALL COST. Regulations require that consequences from design basis events remain acceptable for every reactor.
Severe Accidents (Atmospheric releases)	1	SMALL COST. Risk from atmospheric releases is small.
Severe Accidents (Fallout onto open bodies of water)	1	SMALL COST. Risks from both the drinking water pathway and the aquatic food pathway are small and interdiction can further reduce both sufficiently for all reactors.
Severe Accidents (Releases from groundwater)	1	SMALL COST. Interdiction and the low probability of base mat penetration yield a low risk to the public for all reactors.
Severe Accidents (Economic consequences)	1	SMALL COST. Predicted costs due to postulated accidents range from \$2000/reactor year to \$374,000/reactor-year.
Severe Accident Mitigation Design Alternatives	1	SMALL COST. Ongoing regulatory programs effectively address severe accident issues for all reactors.

## Solid Waste Management

Nonradiological waste	1	SMALL COST. No changes to generating systems are anticipated for license renewal. Existing regulations will ensure proper handling and disposal at all reactors.
Low-level radioactive waste storage	2	SMALL COST. Impacts will be small for reactors having access to offsite disposal space. For those reactors denied the use of off-site disposal space due to delayed compact plans, the potential for ecological habitat disturbance due to construction of on-site storage facilities must be evaluated.
Low-level radioactive waste disposal	2	SMALL COST. Off-site disposal facilities are planning to handle refurbishment and normal operations waste streams for an additional 20 years. If implementation of plans is delayed, reactors in affected compact regions or unaffiliated states must plan for extended interim storage for an indefinite period of time and evaluate the impacts of such storage.
Mixed waste	1	SMALL COST. License renewal will not increase the small, continuing risk to human health and the environment posed by mixed waste at all reactors.
Spent fuel	1	SMALL COST. The 50% greater volume of spent fuel from an additional 20 years of operation can be safely accommodated on-site with small environmental effects through dry or pool storage at all reactors if a permanent repository or monitored retrievable storage facility is not available.

## Draft Rule

[7590-01]

Transportation	1	SMALL COST. Rail and truck transport corridors can safely accommodate increased shipments of radioactive wastes associated with license renewal. Shipments would result in impacts within the scope of the Table S.4 rule and therefore would result in acceptable impact.
		<b>Decommissioning</b>
Radiation doses	1	SMALL COST. Doses to the public are small regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem due to buildup of long-lived radionuclides during the license renewal term.
Waste management	1	SMALL COST. Decommissioning at the end of a 20-year license renewal period would generate no more solid wastes than at the end of the current license term. No increase in the quantities of Class C or greater than Class C wastes would be expected.
Air quality	1	SMALL COST. Air quality impacts of decommissioning are expected to be negligible whether at the end of the current operating term or at the end of the license renewal term.
Water quality	1	SMALL COST. The potential for significant water quality impacts from erosion or spills is no greater if decommissioning occurs after a 20-year license renewal period or after the original 40-year operation period, and measures are readily available to avoid such impacts.
Ecological resources	1	SMALL COST. Decommissioning after either the initial operating period or after a 20 year license renewal period is not expected to have any direct ecological impacts.
Socioeconomic impacts	1	SMALL COST. Decommissioning would have some short-term socioeconomic impacts. The impacts would not be increased by delaying decommissioning until the end of a 20-year relicensing period, but they might be decreased by population and economic growth.

<sup>1</sup> The numerical entries in this column are based on the following category definitions:

- Category 1: A generic conclusion on the impact has been reached for all affected reactors.
- Category 2: A generic conclusion on the impact has been reached for affected reactors that fall within defined bounds.
- Category 3: The environmental impact must be evaluated in each individual license renewal application. A generic conclusion on the impact was not reached for any affected reactors.



Draft Rule

[7590-01]

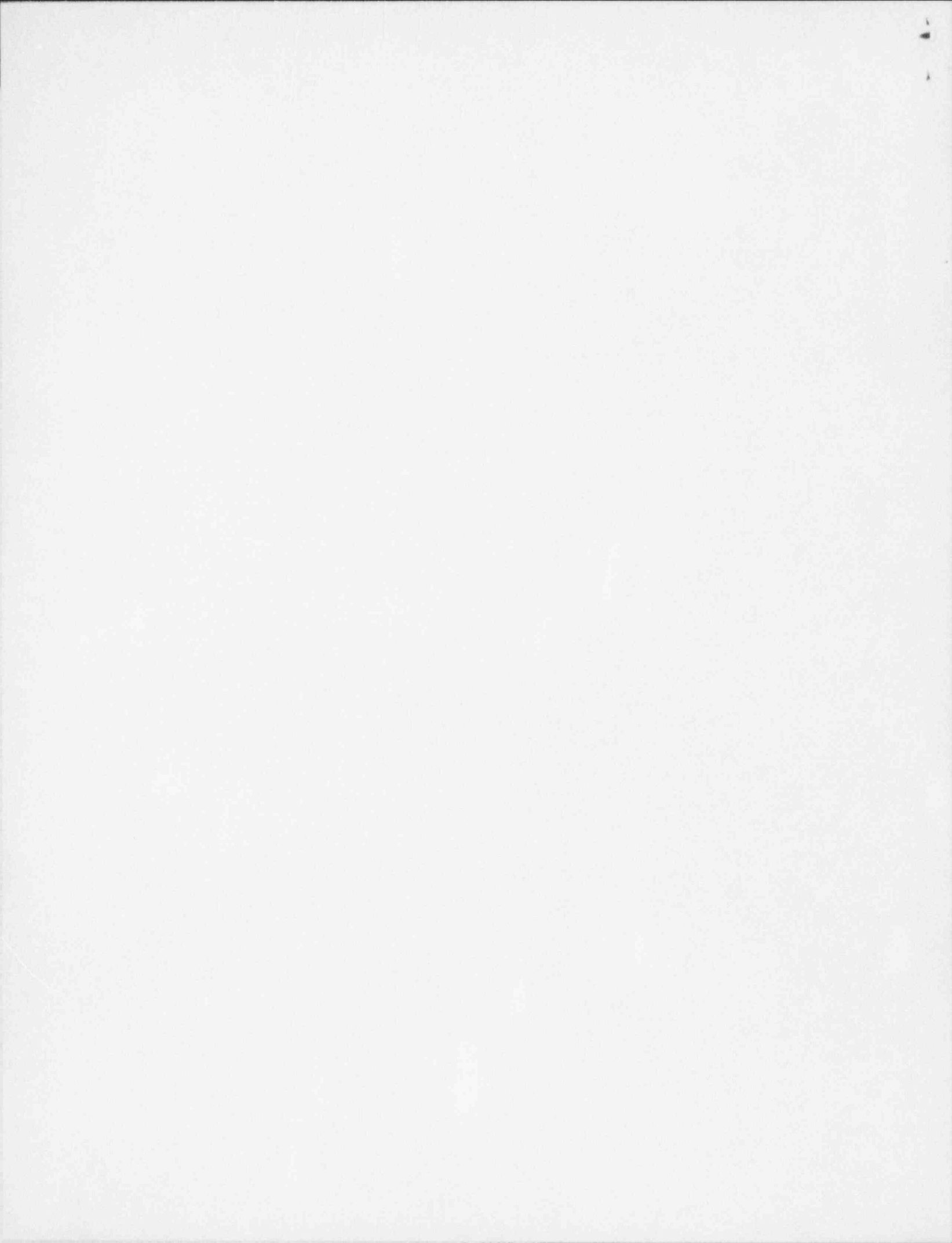
<sup>2</sup> The findings in this column apply to Category 1 issues and Category 2 issues where reactors fall within the bounds of the generic analysis. For Part I of this table, the entry in this column indicates the level of need. For Part II of this table, the entry in this column indicates the relative advantages of alternatives to license renewal. For Part III of this table, the entries in this column are benefits or costs, as indicated by the following headings:

- SMALL impacts are of such minor nature that they either do not warrant detailed investigation or consideration of mitigative actions when they are negative.
- MODERATE impacts are likely to be clearly evident and usually warrant consideration of mitigation alternatives when they are negative.
- LARGE impacts involve either a severe penalty or a major benefit and mitigation alternatives are always considered when the impact is negative.

<sup>3</sup> Although the refurbishment cost is believed to bound most reactors, the uncertainty associated with the economic cost of license renewal leads to the requirement that a demonstration will be made by an applicant for license renewal that there is no cost advantage of replacement of equivalent generating capacity by a new nuclear power reactor, or a new coal or oil fired power reactor. If no such demonstration can be made, a justification for choosing the license renewal alternative must be provided in the application. Costs considered must include refurbishment and construction, fuel, operation and maintenance and decommissioning.

<sup>4</sup> An area is considered to have a medium or high population if any one of the following conditions is satisfied:

- (a) the reactor is within 20 miles of a city of 25,000;
- (b) the reactor is within 50 miles of a city of 100,000;
- (c) the population of the area within 20 miles of the reactor is 75,000 or more;
- (d) the population of the area within 50 miles of the reactor is 1,500,000 or more; or
- (e) the population of the area within 20 miles of the reactor is 50,000 or more and within 50 miles of the reactor the population is more than 400,000.



FEDERAL REGISTER NOTICE (DRAFT)

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NUCLEAR REGULATORY COMMISSION

Draft Generic Environmental Impact Statement for License Renewal  
of Nuclear Power Plants; Availability

The Nuclear Regulatory Commission (NRC) has published a Draft Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants (NUREG-1437). This impact statement identifies and assesses potential environmental impacts resulting from renewing the operating license of individual nuclear power plants. Potential impacts were categorized into 103 issues. Most issues were found to be suitable to be addressed generically. The NRC has concluded that only 24 issues require further analysis in individual plant relicensing cases. The findings in the impact statement are to be codified in NRC environmental protection regulations, 10 CFR Part 51.

Supplementary information on the impact statement maybe found in the Notice of Proposed Amendments on Environmental Review for Operating Licenses, 10 CFR Part 51. in the rulemaking section of this Federal Register issue.

A free single copy of draft NUREG-1437, may be requested by those considering public comment by writing to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. A copy is also available for inspection and/or copying for a fee in the NRC Public Document Room, 2120 L Street, N.W. (lower level) Washington, D.C.

Written comments may be submitted to: Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration and Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Dated at Rockville, Maryland, this \_\_\_\_ day of \_\_\_\_\_, 1991.

For the Nuclear Regulatory Commission

Samuel J. Chilk  
Secretary of the Commission

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Samuel J. Chilk  
Secretary of the Commission