



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL
STANDARD
REVIEW PLAN**
OFFICE OF NUCLEAR REACTOR REGULATION

**STANDARD REVIEW PLANS FOR
ENVIRONMENTAL REVIEWS FOR
NUCLEAR POWER PLANTS**

Supplement 1: Operating License Renewal

October 1999

OFFICE OF NUCLEAR REACTOR REGULATION
U.S. NUCLEAR REGULATORY COMMISSION

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NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

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ABSTRACT

This document provides guidance to Nuclear Regulatory Commission staff in implementing provisions of 10 CFR 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions,” related to reactor operating license renewals. It supplements NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*, which covers reviews related to reactor construction permits, initial operating licenses, early site permits, and combined licenses. Reviews conducted following this review plan lead to preparation of site-specific environmental impact statement supplements to NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*.

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ABBREVIATIONS AND ACRONYMS

| | |
|-------|---|
| AEA | Atomic Energy Act |
| AEP | Archaeology and Ethnography Program |
| ALARA | as low as is reasonably achievable |
| ALI | annual limit on intake |
| ANS | American Nuclear Society |
| ANSI | American National Standards Institute |
| AWWA | American Water Works Association |
| BEIR | biological effects of ionizing radiation |
| BMP | best management practice |
| BOD | biological oxygen demand |
| BWR | boiling-water reactor |
| CAA | Clean Air Act |
| CDC | Centers for Disease Control and Prevention |
| CEQ | Council on Environmental Quality |
| CFC | chlorinated fluorocarbons |
| CFR | Code of Federal Regulations |
| CG&E | Community Gas & Electric Corporation |
| CH | Central Hudson Gas & Electric Corporation |
| COD | chemical oxygen demand |
| COL | combined license |
| CP | construction permit |
| CWA | Clean Water Act |
| DAC | derived air concentration |
| DBA | design basis accident |
| DBF | design basis flood |
| DEIS | draft environmental impact statement |
| D/Q | relative deposition |
| DSEIS | draft supplemental and environmental impact statement |
| EA | environmental assessment |
| EIS | environmental impact statement |
| EMF | electromagnetic field |
| EPA | U.S. Environmental Protection Agency |
| EPM | Environmental Project Manager |
| EPRI | Electric Power Research Institute |
| ER | environmental report |
| ES | environmental standard |
| ESA | Endangered Species Act |
| ESP | early site permit |

| | |
|---------|---|
| ESRP | environmental standard review plan (NUREG-1555) |
| ESRP/S1 | environmental standard review plan, Supplement 1 (NUREG-1555, Supplement 1) |
| FAA | Federal Aviation Administration |
| FDA | Food and Drug Administration |
| FEIS | final environmental impact statement |
| FERC | Federal Energy Regulatory Commission |
| FES | final environmental statement |
| FGD | flue-gas-desulfurization |
| FR | Federal Register |
| FSAR | final safety analysis report |
| FSEIS | final supplemental environmental impact statement |
| FWCA | Fish and Wildlife Coordination Act |
| FWPCA | Federal Water Pollution Control Act |
| GEIS | Generic Environmental Impact Statement for License Renewal of Nuclear Power Plant (NUREG-1437) |
| GEn&SIS | <u>G</u> eographical, <u>E</u> nvironmental & <u>S</u> iting <u>I</u> nformation <u>S</u> ystem |
| GIS | Geographic Information System |
| HASL | Health and Safety Laboratory |
| HTGR | high-temperature gas-cooled reactor |
| IAEA | International Atomic Energy Agency |
| IASD | Interagency Archeological Service Division |
| INEEL | Idaho National Engineering and Environmental Laboratory |
| IPE | Internal Plant Examination |
| IPEEE | Internal Plant Examination of External Events |
| kWh | kilowatt-hour |
| LADTAP | computer code |
| LLW | low-level waste |
| LOS | level of service |
| LR | license renewal |
| LWR | light-water-cooled reactor |
| MWe | megawatts electrical |
| MWt | megawatts thermal |
| NAGPRA | Native Graves Protection and Repatriation Regulations |
| NCDC | National Climatic Data Center |
| NCRP | National Council on Radiation Protection and Measurements |
| NEPA | National Environmental Policy Act of 1969 |

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|--------|---|
| NESC | National Electrical Safety Code |
| NHPA | National Historical Preservation Act |
| NM | Niagara Mohawk Power Corporation |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| NRC | U.S. Nuclear Regulatory Commission |
| NRCS | Natural Resources Conservation Service |
| NRR | Office of Nuclear Reactor Regulation |
| NWS | National Weather Service |
| OAHP | Office of Archaeology and Historic Preservation |
| ODCM | Offsite Dose Calculation Manual |
| O&R | Orange and Rockland Utilities, Inc. |
| OL | operating license |
| OSHA | Occupational Safety and Health Administration |
| PAM | primary amoebic meningoencephalitis |
| PPC | Public Power Corporation |
| PPP | Public Power Plant |
| PRA | probabilistic risk assessment |
| PSAR | preliminary safety analysis report |
| PSDAR | post-shutdown decommissioning activities report |
| PUD | Public Utility District |
| PWR | pressurized-water reactor |
| RAI | request for additional information |
| RCRA | Resource Conservation and Recovery Act |
| RG&E | Rochester Gas and Electric Corporation |
| ROI | region of interest |
| RRY | reference reactor year |
| SAMA | severe accident mitigation alternatives |
| SAMDA | severe accident mitigation design alternatives |
| SAR | safety analysis report |
| SEIS | supplemental environmental impact statement |
| SER | safety evaluation report |
| SHPO | State Historic Preservation Officer |
| SPP | Sterling Power Plant |
| SRP | Standard Review Plan (for the Review of Safety Analysis Reports (NUREG-0800)) |
| SSER | Supplemental Site Safety Evaluation Report |
| STORET | STorage and RETrieval System (for Water and Biological Data) |

| | |
|----------|---------------------------------|
| TEDE | total effective dose equivalent |
| TVA | Tennessee Valley Authority |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| UTM | Universal Transverse Mercator |
| χ/Q | normalized concentration |

INTRODUCTION

This document contains environmental standard review plans (ESRPs), which constitute a series of instructions developed for U.S. Nuclear Regulatory Commission (NRC) staff use in conducting environmental reviews of applications related to nuclear power plants. More specifically, the environmental review plans in this document are for use in reviews associated with applications for reactor operating license renewal. Reviews related to applications for construction permits, initial operating licenses, combined licenses, and early site permits should be conducted using review plans in the base document NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b).

ESRPs are companions to regulatory guides that address siting and environmental issues. For example, NUREG-1555 is the companion to Regulatory Guide 4.2, Rev. 2, *Preparation of Environmental Reports for Nuclear Power Stations* (NRC 1976). Regulatory Guide 4.2 provides guidance in preparing environmental reports related to applications for construction permits, initial operating licenses, combined licenses, and early site permits. These ESRPs are companions to Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a). Regulatory Guide 4.7, Rev. 2, *General Site Suitability Criteria for Nuclear Power Stations* (NRC 1998), provides additional environmental guidance to applicants.

Questions regarding the content of any plan in this document may be directed to the responsible organization within NRC, at the following address:

Generic Issues, Environmental, Financial and Rulemaking Branch
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Additional copies of these plans may be obtained as indicated on the inside front cover of this document.

NRC's Implementation of the NEPA Process

The National Environmental Policy Act of 1969 (NEPA), as amended, directs that all agencies of the Federal Government comply with the procedures in Section 102(2) of NEPA, except where compliance would be inconsistent with other statutory requirements. The *Code of Federal Regulations* (CFR), 10 CFR 51, Subpart A, "National Environmental Policy Act—Regulations Implementing Section 102(2)," implements NEPA Section 102(2) in a manner that is consistent with NRC's domestic licensing and related regulatory authority under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, and reflects the Commission's policy to voluntarily take account of the regulations of the Council on Environmental Quality (CEQ), subject to certain conditions. The Commission recognizes a continuing obligation to conduct its domestic licensing and related regulatory functions in a manner that is both receptive to environmental concerns and consistent with the Commission's responsibility as an independent regulatory agency for protecting the radiological health and safety of the public.

In 10 CFR 51.95(c), the Commission has stated its intent to prepare an environmental impact statement (EIS) in connection with the renewal of an operating license for a nuclear power plant under 10 CFR 54. When an application for renewal of a license is received, a notice of intent will be published in the *Federal Register*, and an appropriate scoping process will be conducted. The contents of the notice of intent and the participants in and covered by the scoping process are outlined in 10 CFR 51.27, 10 CFR 51.28, and 10 CFR 51.29, respectively. In general, the scoping process is open to anyone who requests an opportunity to participate; scoping meetings are usually conducted in the vicinity of the nuclear power plant and are open for public participation. However, participation in the scoping process for an EIS does not entitle the participant to become a party to the proceeding to which the EIS relates (10 CFR 51.28[c]). Areas covered in the scoping process include (10 CFR 51.29[a])

- defining the proposed action
- determining the scope of the EIS and identification of significant issues
- identifying and eliminating from detailed study issues that are peripheral, not significant, or that have been covered by prior environmental reviews
- identifying other environmental assessments (EAs) or EISs related to, but not part of, the scope of the EIS under consideration
- identifying other environmental reviews and consultations that are required
- indicating the relationship of preparation timing to the EIS Commission's planning and decision making schedule
- identifying cooperating agencies
- describing the means by which the EIS will be prepared.

At the conclusion of the scoping process, the appropriate NRC staff director will prepare a concise summary of the determinations and conclusions reached, including the significant issues identified, and send a copy of the summary to each participant in the scoping process.

For license renewal, the responsibility for the environmental review and preparation of the supplemental EIS rests with the Environmental Project Manager (EPM). The EPM interacts with the applicant's or licensee's top level technical and supervisory personnel as well as with NRC management. In addition, the EPM coordinates the efforts of numerous staff personnel in many complex disciplines within both formal requirements and management approved guidance. With assistance from review personnel and consultants, the EPM develops the overall recommendations for action to be taken by the Director of the Office of Nuclear Reactor Regulation (NRR).

The details of EPM responsibilities related to environmental reviews are laid out in NUREG/BR-0073, *Project Manager's Handbook* (NRC 1989c). They include managing the acceptance review of the applicant's environmental report (ER) and managing the environmental reviews performed by the staff and consultants. The acceptance review determines whether the information included is sufficient to satisfy Commission requirements for a detailed review. If the application is not sufficiently complete, the staff identifies those areas that are deficient to the EPM. When the application is reasonably complete, it is docketed, and the detailed review process may begin.

The applicant's ER is reviewed technically by the functional review branches in the NRR divisions and by the EPM. Details of the responsibility of each branch in carrying out review functions, including criteria for acceptability, are contained in the ESRPs. During the course of the staff's review, it is usually necessary to request additional information about a number of issues. Reviewers formulate questions to elicit this additional information from the applicant. Requests for additional information (RAIs) are transmitted to the applicant by the EPM. RAIs also serve as a public record of the staff's concerns about the application at the review stage.

When the review and evaluation of the applicant's ER have progressed to the point at which the EPM and reviewers have completed their review and evaluation, sections of a draft supplemental environmental impact statement (SEIS) are prepared. In the case of an application for license renewal, the draft SEIS will be a supplement to the NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plant* (NRC 1996), (10 CFR 51.95[c]). NUREG-1437 is frequently referred to as the generic environmental impact statement (GEIS). Review plans contained in this document provide procedures for the environmental review leading to the draft SEIS. The staff plans to conduct a detailed analysis for a limited number of topics as, for most topics, the staff will adopt the analyses of the GEIS in its site-specific SEIS. Material for the draft SEIS is provided to the EPM, who is responsible for critically reviewing each submittal from the reviewers and ensuring that the conclusions of the draft SEIS are representative of the review team and reflects NRC policy. CEQ regulations in Chapter V of Title 40 of the Code of Federal Regulations and guidance related to the NEPA process (CEQ 1981) set standards for EISs. In accordance with these standards, it is expected that each EIS prepared using the guidance in these ESRPs will

- stand on its own as an analytical document which fully informs decisionmakers and the public of the environmental effects of the proposed action and those of reasonable alternatives
- emphasize the issues that are significant and reduce emphasis on other issues and background material
- be written in plain language.

Tiering will be used when appropriate to reduce EIS length. However, it should not be carried to the point where it is necessary to refer to other documents to obtain information essential to a basic understanding of the issues addressed in the EIS. Rather, tiering should be used to direct interested readers to more detailed discussions of specific issues.

When an acceptable draft SEIS has been assembled, it is submitted for review and comment to the project director, the Office of the General Counsel, and the division directors of the participating review groups. Final approval is obtained from the EPM's division director before publication of the draft SEIS for public comment.

The draft SEIS issued to the public is a summary of the staff's initial conclusions regarding an application. The draft SEIS is not a draft in the sense of being incomplete. Rather, it is a draft discussion of the proposed action and the staff's assessment of its potential benefits and environmental costs that is presented to the public to provide them with an opportunity to comment, request clarification, and recommend changes. The public can also provide additional information to the staff on whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

If no comments are received, the draft SEIS can be published as a final SEIS. If comments are received, they are considered by the staff, and staff responses are located in one section of the final SEIS so that readers can determine the staff's response to comments. Responses to comments may take one or more of several forms: a portion of the draft SEIS may be changed, new material may be added to the appropriate section identified in the discussion of comments, or no change may ensue.

The final SEIS is a summary of the evaluation of the environmental portion of the application relative to the anticipated impact of the proposed action on the environment. It is provided to the public and is used as the main body of environmental evidence at any public hearing to support the Commission's conclusion that the proposed action should be approved or rejected.

The Generic Environmental Impact Statement for License Renewal of Nuclear Plants

NUREG-1437,^(a) *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, was prepared by the NRC in anticipation of applications for license renewal. It assesses the environmental impacts associated with nuclear power plant license renewal and an additional 20 years of power plant operations based on more than 1000 reactor-years of operating experience with nuclear power plants accumulated in the United States. It provided the technical basis for revision of 10 CFR 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," with regard to license renewal under 10 CFR 54.

NUREG-1437 examines the potential impacts of refurbishment activities in preparing to operate during the renewal period and the potential impacts of those operations. Potential environmental impacts

(a) NUREG-1437 was originally issued in 1996. Addendum 1 to NUREG-1437 was issued in 1999. Hereinafter, all references to NUREG-1437 and the "GEIS" include NUREG-1437 and its Addendum 1 (NRC 1999c).

associated with 92 issues related to license renewal are identified and evaluated. Using a standard of significance that considered both “context” and “intensity,” each impact is assigned one of three significance levels:

SMALL: For the issue, environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission’s regulations are considered small.

MODERATE: For the issue, environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.

LARGE: For the issue, environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the issues considered, the analysis reported in NUREG-1437 shows

- the environmental impacts associated with the issue have been determined to apply to either all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics
- a single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level-waste and spent fuel disposal)
- mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

These issues were assigned to Category 1. Of the remaining 23 issues, 21 have been assigned to Category 2 because the analysis showed that one or more of the criteria leading to assignment to Category 1 could not be met. No conclusion was reached on the other two issues. The results of the analyses in NUREG-1437 have been codified in Appendix B to Subpart A of 10 CFR 51.

Scope of the Supplemental Environmental Standard Review Plans

The original ESRPs in NUREG-0555, *Environmental Standard Review Plans for the Environmental Review of Construction Permit Applications for Nuclear Power Plants* (NRC 1978), were prepared specifically for the environmental review of applications for construction permits (CPs) and initial operating licenses (OLs) for nuclear power plants under 10 CFR 50. These reviews, which involve new nuclear power plants, are referred to as “green field” reviews. NUREG-1555 contains updated and revised ESRPs to guide the staff’s environmental reviews for a range of applications involving “green

field” sites and preparation of a full EIS. A new nuclear power plant at an existing nuclear power plant site would also be evaluated by the staff using NUREG-1555.

The supplemental ESRPs in this document guide the staff review of the limited set environmental issues associated with license renewal. They address the set of environmental issues addressed in NUREG-1437 and any newly emerging issues not addressed in NUREG-1437, and they provide the framework for preparation of sections for a site-specific supplement to NUREG-1437. A detailed review procedure is included for each Category 2 issue and for environmental justice. In addition, the ESRPs provide for systematic integration of significant new information on Category 1 issues. In the absence of significant new information, the supplemental ESRPs lead to adoption, by reference, of the generic conclusions of NUREG-1437 for Category 1 issues.

The scope of the supplemental ESRPs is more limited than the scope of the ESRPs in NUREG-1555 because

- license renewal deals with an existing plant, not a “green field” site
- NUREG-1437 has addressed the environmental impacts of refurbishment and operation during the renewal term in detail
- the conclusions reached in NUREG-1437 have been codified in 10 CFR 51
- the SEIS for license renewal is not required to discuss the need for power or the economic costs and economic benefits of the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of alternatives in the range of alternatives considered or relevant to mitigation (10 CFR 51.95[c][2])
- a different decision criterion is used in the license renewal decision.

Use of the supplemental ESRPs by the NRC staff in the environmental review process will ensure

- identification and review of data essential to specific environmental issues and the subsequent decisionmaking process
- consideration of other Federal, State, regional, local, and affected Native American tribal requirements applicable to specific environmental issues, as appropriate
- standardization of analytical and evaluation procedures for review of each issue
- concentration on review of the potential environmental impacts of significance.

Organization of the Environmental Standard Review Plan Supplement

This supplement to NUREG-1555 consists of an introduction followed by supplemental ESRPs. The introduction contains general information applicable to all ESRPs that is regarded as if it were in each ESRP.

The supplemental ESRPs are numbered as sections of nine chapters. In-text references to ESRPs, such as “ESRP Chapter 3,” refer to the entire chapter (all review plans), while “ESRP/S1 3.0,” for example, refers only to the specific plan (section) ESRP/S1 3.0. The chapters, which follow the general outline of NUREG-1437 and form the outline for an EIS supplement, are

- 1 Introduction
- 2 Description of the Environment and Plant
- 3 Environmental Impacts of Refurbishment
- 4 Environmental Impacts of Operation During the Renewal Term
- 5 Environmental Impacts of Postulated Accidents
- 6 Environmental Impacts of the Uranium Fuel Cycle and Solid Waste Management
- 7 Environmental Impacts of Decommissioning
- 8 Alternatives to License Renewal
- 9 Summary and Conclusions

These chapters may be logically considered in three groups. Chapters 1 and 2 are descriptive in nature. They guide the staff’s review of the regional setting for the proposed action, the detailed description of the site, the plant, and its environment, and the detailed description of those features of the plant that are most likely to affect the environment. Chapters 3 through 7 are related to the technical analyses. They guide the staff’s review of potential environmental impacts associated with refurbishment and operation of the plant during the renewal term. Finally, Chapters 8 and 9 are related to the overall evaluation of the proposed action. They guide the staff’s comparison of the proposed action with alternatives and summarization of the conclusions related to the proposed action.

Within each chapter, the first review plan guides the preparation of an introduction to the chapter for the SEIS, and the last review plan guides the preparation of a list of references cited in the SEIS chapter. The initial review plans in Chapters 3 through 6 have two additional functions: (1) to identify those Category 1 and 2 issues that are not applicable to the plant because of plant design and (2) to identify

issues for which there is significant new information and direct readers to SEIS sections where the significant new information is discussed.

Review plans identified by two-digit numbers (e.g., ESRP/S1 3.5) serve to guide

- the evaluation of the applicant's process for identification and evaluation of new information
- evaluation of information presented in the applicant's ER, information submitted by the public during the scoping process, and information identified in the staff's independent review to determine whether new information is significant
- preparation of a statement for the SEIS that adopts the analyses of NUREG-1437 for Category 1 issues for which there is no significant new information
- preparation of introductory statements for the SEIS for Category 2 issues applicable to the plant.

Two supplemental ESRPs (3.9 and 4.7) have been provided for the treatment of new and significant information. If there is significant new information, these supplemental ESRPs direct preparation of statements for the SEIS that introduce the information. Otherwise, they direct the preparation of statements concluding that there is no significant new information.

Review plans in Chapters 3 through 7 identified by three-digit numbers (e.g., ESRP/S1 3.5.1) deal with Category 2 issues and issues that the NRC staff must address in the SEIS. These review plans

- direct review of the discussion of the specific issue in NUREG-1437 to identify the nature of the issue and the reasons that a generic conclusion could not be reached
- identify the information required to complete a site-specific review of the issue
- provide a systematic procedure for completion of the review that permits termination of the analysis as soon as an appropriate conclusion can be reached
- guide preparation of statements for the SEIS that describe the issue and present the conclusion.

The format of the supplemental ESRPs in this document conforms to the format of ESRPs in NUREG-1555. It consists of the following six sections:

- I. Areas of Review
- II. Acceptance Criteria
- III. Review Procedures

IV. Evaluation Findings

V. Implementation

VI. References

Areas of Review describes the purpose and scope of the review. It includes a list of review interfaces. These interfaces define the expected flow of information in the review process. **Acceptance Criteria** provides guidance on determining the acceptability of the applicant's submission with respect to the topic under review. **Review Procedures** describes the methods that the staff should use in conducting the review. The level of detail in the description of methods varies from review plan to review plan. In general, the review procedures sections of review plans dealing with Category 1 and 2 issues are structured to permit termination of the review as soon as sufficient information has been obtained and analyzed to allow the staff to reach a conclusion related to the significance of the potential impacts and evaluate mitigation measures. **Evaluation Findings** provides guidance on how to summarize the conclusions of the review. This guidance frequently includes samples of the types of statements that should be included in an SEIS. **Implementation** contains a standard statement that describes how the review plan is expected to be used. Finally, the **References** section contains the bibliographic information related to material cited in the review plan.

Each ESRP contains a lists of data and information needs under **Areas of Review**. In many cases, a likely source of an item is indicated in parentheses or brackets at the end of the item identification in the list. Reviewers may need to search for items when the item is not found in the likely source, or when a likely source is not listed. In these cases, the following sources of information should be considered, as appropriate;

- applicant's environmental report (ER)
- previous NRC Final Environmental Statements and Final Environmental Impact Statements
- applicant's Safety Analysis Report or Updated Final Safety Analysis Report
- NRC Safety Evaluation Reports
- generic environmental impacts statements, especially NUREG-1437
- other Federal agencies
- State environmental agencies.

Databases maintained by other Federal agencies may be accessible through the NRC Geographical Environmental & Siting Information System (GEn&SIS).

The Supplemental ESRPs for license renewal address two issues that generally have not been addressed in EISs: Environmental Justice (EJ) and Severe Accident Mitigation Alternatives (SAMAs). The following paragraphs provide the historical background to the additions of these issues.

- **Environmental Justice**

The President issued Executive Order 12898 in October 1994 mandating that Federal agencies make “environmental justice” part of each agency’s mission by addressing disproportionately high and adverse human health or environmental effects of Federal programs, policies, and activities on minority and low-income populations. Although it is not subject to the executive order, the Commission has voluntarily committed to undertake environmental justice reviews. NRR Office Letter No. 906, Revision 1 (NRC 1996) contains interim guidance to NRR staff on conducting EJ reviews. Office Letter No. 906 is revised periodically. The latest revision should be consulted to ensure use of current guidance in environmental reviews.

The guidance in NRR Office Letter No. 906 is reflected in this document by the addition of three new ESRPs. ESRP/S1 2.2.8 contains procedures for identifying and describing minority and low-income populations that could be impacted by a proposed action. ESRP/S1s 3.6.7 and 4.4.6 cover the subsequent staff assessment and evaluation of specific impacts for refurbishment and operation during the renewal term, respectively. In addition, wording changes in other ESRPs now reflect the NRC commitment to address EJ issues.

- **Severe Accident Mitigation Alternatives**

At the time the original ESRPs were published, the NRC staff EISs did not consider alternatives to mitigate the consequences of severe accidents. Current NRC policy, developed after the Limerick decision (*Limerick Ecology Action v. NRC*, 869 F.2d 719 [3rd Cir. 1989]), requires consideration of alternatives to mitigate the consequences of severe accidents in EISs prepared at the OL stage. Consideration of SAMAs is required at the license renewal (LR) stage for the plants for which a site-specific SAMA analysis has not been included in an EIS or SEIS.

SAMAs have been included in NUREG-0974, *Limerick 1 and 2 Operating License* (NRC 1989), NUREG-0775, *Comanche Peak 1 and 2 Operating License Review* (NRC 1989), operating license reviews, and in NUREG-0498, *Final Environmental Impact Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2* (NRC 1995). ESRP/S1 5.2.1 has been prepared to guide staff in the consideration of SAMAs at the LR stage.

Significant New Information

In its SEIS, the NRC staff is required to integrate any significant new information on the environmental impacts of LR with conclusions in NUREG-1437 related to Category 1 issues and information on open Category 2 issues applicable to the plant. This section describes the identification of new information, evaluation of the significance of new information, and the treatment of significant new information when

found. When no significant new information is found in an area, a statement should be included in the SEIS that briefly describes the search for and evaluation of new information and states that no new information was identified or none of the new information was determined to be significant.

When significant new information is identified for a Category 1 issue, reconsideration of conclusions in NUREG-1437 for that issue is limited in scope to assessment of the relevant new information. The scope of the assessment does not include review of other facets of the issue that are not affected by the new information.

It is incumbent on the staff to initiate the process to become aware of new information that could have a bearing on the environmental aspects of the LR application before asserting that there is no new information. The process should consider

- the applicant's ER. Applicants are required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which they are aware. In reviewing the applicant's ER, consider the applicant's process for discovering and evaluating the significance of any new information. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information, if it existed?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Is the information new in the sense that it post dates the analysis leading to NUREG-1437?
- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?
- technical literature. Does recent technical literature contain information that would alter conclusions in NUREG-1437 related to Category 1 issues? Does the recent literature indicate that there may be environmental impacts related to nuclear power plant refurbishment or operation during a renewal term that were not considered in NUREG-1437?

When new information is identified, the information should be used to develop precisely defined environmental issues. After the issues have been defined, the significance level of each issue should be determined using the significance level definitions in NUREG-1437. Mitigation measures should be identified and considered for each issue for which there is an environmental impact. The consideration of mitigation measures should be proportionate to potential impacts.

If the significance level is MODERATE or LARGE, the reviewer should prepare a statement for inclusion in the appropriate section of the SEIS that includes a concise description of the new information (including source) and how the information applies to the applicant's plant. The statement should give the significance level of the potential impacts, and it should list those mitigation measures that are

considered appropriate. The reviewer should also provide the appropriate reviews with a summary statement and a list of references cited in the SEIS statement.

General Instructions

The following instructions, applicable to most of the ESRPs, are provided here to avoid repetition in each plan:

- **Project Overview.** As an initial step in each individual environmental review, the reviewer is expected to develop an understanding of the entire project proposed by the applicant. The purpose of this instruction is to ensure that reviewers put their individual reviews in perspective with the overall project and concentrate their efforts on issues of substance. This general project review is to be conducted as the first step (acceptance review phase) of the overall environmental review process and is to be completed before developing requests for additional information.
- **Internal Review Coordination.** The EPM is the central point of contact for all reviewers. Although each ESRP represents a discrete segment of the NRC's overall environmental review, no review can be completed without coordination with related reviews. For example, the technical analysis ESRPs (in Chapters 3 through 7) rely on the descriptive chapters (1 and 2) for background information. All reviewers are instructed to maintain close communication with other reviewers throughout the review procedure. With very few exceptions, the reviews on a given project are conducted in parallel; thus, completed "output" of related reviews may not be available to reviewers before their own environmental review is initiated.
- **External Review Coordination.** The EPM usually initiates contacts with outside groups and must be informed of all such contacts as outlined in NUREG/BR-0073, the NRC *Project Manager's Handbook* (NRC 1989c). Each reviewer is expected to seek out and be aware of any related technical analyses and assessments in areas of concurrent jurisdiction, such as air and water quality and aquatic impacts. Particular attention should be given to those analyses and assessments prepared under provisions of memoranda of understanding between the NRC and other Federal, State, regional, local, and affected Native American tribal agencies. When so directed by the specifics of the memoranda of understanding, the reviewer participates with officials in the development of the impact assessments directed by these ESRPs. Working through the EPM, the reviewer is responsible for resolving any differences of opinion between staff analyses and analyses of other agencies. When resolution of differences is not possible, the reviewer ensures that all viewpoints are addressed in the EIS or that the specific provisions of the memoranda of understanding for this contingency are followed.
- **Consultation with Other Agencies.** The environmental reviews leading to preparation EISs involve interactions with other Federal, State, regional, local and affected Native American agencies. The agencies that may be consulted include, but are not limited to, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service related to threatened and endangered species, the State Historic Preservation Officer and local and affected Native American tribal agencies related to historic

and archeological resources that are eligible for listing of the National Register of Historic Places; relevant State agencies relative to consistency determinations under the Coastal Zone Management Act and relevant State agencies relative to determination that the proposed action conforms to applicable State Implementation Plans under the Clean Air Act. These consultations should be started as soon as possible in the review process and should be made through the EPM.

- **Consultation with the Applicant.** The analysis procedures for many of the ESRPs direct the reviewer to “consult with the applicant” in certain specified circumstances. All consultations of this nature are made through the EPM.
- **Site Visit.** In most environmental reviews, reviewers benefit from a visit to the site of the applicant’s proposed action. This visit gives the reviewer first hand knowledge of the location and position of the applicant’s facilities within the site. It also gives the reviewer an opportunity to observe the environment in the vicinity of the site.
- **Depth of Review.** Where an analysis procedure, as outlined in an ESRP, has been conducted by an applicant and reported in the applicant’s ER, the applicant’s work is evaluated in sufficient depth to permit independent verification of the analysis and its results. The reviewer may conduct independent analyses, if necessary.
- **Consideration of Mitigation.** Mitigation measures should be considered in proportion to the level of the impact when a potentially adverse impact is identified. Statements related to mitigation should describe the potential effectiveness of the mitigation measures considered and state whether mitigation measures are warranted or not.
- **GEn&SIS.** The NRC has developed a geographical information system for staff use (GEn&SIS). This system includes environmental data and links to other Internet sites that have data that may be important in environmental analyses. Reviewers are expected to make use of GEn&SIS and its links to other sources of information in reviewing an applicant’s ER and in performing independent analyses.
- **Best Management Practices.** The analysis procedures in ESRPs often direct the reviewer to evaluate the applicant’s commitments to use construction, refurbishment, or maintenance practices that limit adverse impacts. These practices, often referred to as best management practices (BMPs), are construction and refurbishment activities that tend to mitigate adverse environmental impacts. Many practices are chosen to prevent or control water pollution and minimize soil erosion resulting from land disturbance or other land-management activities. Examples of construction activities recognized as BMPs can be found in a number of sources, some of which are referenced below. BMPs not referenced below are generally acceptable when they have been used by another Federal agency.
- **Quality Assurance.** In evaluating the applicant’s environmental information, reviewers should identify and evaluate the quality assurance measures taken by the applicant in the collection and

analysis of data. Quality assurance measures are also evaluated where computer models have been used to predict environmental consequences of the proposed actions.

- **Findings.** The sections of an EIS that summarize findings for the NRC decision-makers should reflect the results of a “consensus” agreement among the reviewers. This requires input from the reviewer, the EPM, and any other reviewers who would be affected by the findings.
- **Documentation.** Each reviewer maintains documentation, logs, and other records to ensure that records of contacts with outside agencies and organizations are maintained.
- **Definitions.** Use of the following terminology applies only to the environmental review process. Terms such as plant and station, as used in an EIS, continue to reflect an applicant’s choice of terms to identify the proposed project (e.g., Calvert Cliffs Nuclear Power Plant, Oconee Nuclear Station).

STATION: All facilities (reactors, control buildings, intakes, discharges, etc.) that are located or are proposed to be located on the applicant’s site. Generally, the station includes everything located on the applicant’s property that surrounds the proposed or existing reactors. In some cases, intakes and discharges may be beyond this property line, but are considered part of the station. Transmission lines and their associated facilities are not considered part of the station. Existing or proposed facilities not associated with the production of electricity (e.g., a visitor center or a fish hatchery) are considered part of the station.

PLANT: The proposed nuclear reactors, reactor power conversion systems, intakes, discharges, and all other on-station facilities involved with the production of electricity. A plant can be more than one reactor power conversion system, but does not include existing units already in operation. Transmission lines and other off-station facilities are not part of the plant.

UNIT: One reactor power conversion system. Generally, unit is used only when the applicant is proposing a multi-unit plant.

FACILITY: Any identifiable part of the station or associated portions of the applicant’s system, both existing and proposed. Examples: The visitor center is a facility. A substation is a facility. An intake system could be a facility (if separated from the remainder of the plant).

PROJECT: Everything the applicant is proposing. This includes transmission lines, access roads, communications stations, etc.

As used in these ESRPs, mitigation and avoidance will have the following meanings:

MITIGATION: Impact mitigation is the process of modifying a design or practice (either a construction practice or an operating procedure) to lessen its environmental impact. Successful mitigation will remove an impact from the “adverse” category.

AVOIDANCE: Impact avoidance is the process of using an alternative design or practice that avoids the identified adverse impact. Note that alternatives may have adverse impacts of their own and must be evaluated to ensure that any such impacts can be successfully mitigated.

Related Documents

The ESRPs are only one of several sets of procedures used by the NRC to meet its responsibilities under NEPA. Other documents that provide guidance relevant to environmental reviews for license renewal include

- NUREG/BR-0073, *Project Manager's Handbook* (NRC 1989c) (More recent versions of this document exist; however, such documents do not provide substantive guidance on environmental impact statement development.)
- Office of Nuclear Reactor Regulation Office Letter No. 906, "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues," (NRC 1996)
- Regulatory Guide 4.2, Rev. 2. *Preparation of Environmental Reports for Nuclear Power Stations* (NRC 1976)
- Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a)
- Regulatory Guide 4.7, Rev. 2. *General Site Suitability for Nuclear Power Stations* (NRC 1998)
- NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, (NRC 1987).

The *Project Manager's Handbook* provides staff with guidance on determining when an environmental document must be prepared, the type of environmental document that should be prepared, and procedural matters related to the preparation of environmental documents. The collection and evaluation of material for environmental documents generally involves frequent interactions with the applicant as the staff examines the available information and identifies issues requiring clarification or additional information. The handbook provides guidance on these interactions and on interactions with other NRC staff who deal with the applicant on other matters.

The NRR Office Letter No. 906 establishes procedures and provides guidance related to the preparation of environmental assessments and the consideration of environmental issues for licensing actions. Procedures and guidance in the office letter specifically relate to the Coastal Zone Management Act, the Endangered Species Act, the National Historic Preservation Act, and Executive Order 12898 dealing with EJ.

Regulatory Guide 4.2 provides guidance to applicants on the preparation of ERs for nuclear power stations.

NRC Regulatory Guide 4.2, Supplement 1, provides guidance on the preparation of supplemental ERs for license-renewal applications.

Regulatory Guide 4.7 provides applicants with guidance in the initial stage of selecting potential sites for nuclear power stations. It discusses the major site characteristics related to public health and safety and the environmental issues considered in determining the suitability of sites for light-water cooled reactors.

NUREG-0800 deals primarily with issues related to safety. It contains several sections on the evaluation of the consequences of accidental releases of radioactive material. Although the emphasis of the analyses conducted under the SRPs is somewhat different than that of the analyses conducted under the ESRPs, the results of the SRP analyses are relevant to environmental reviews.

References

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

10 CFR 51, Subpart A, “National Environmental Policy Act—Regulations Implementing Section 102(2).”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 51.27, “Notice of intent.”

10 CFR 51.28, “Scoping—participants.”

10 CFR 51.29, “Scoping—environmental impact statement.”

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants.”

Atomic Energy Act of 1954, as amended, 42 USC 2011 et seq.

Clean Air Act Amendments of 1977, as amended, 41 USC 7401 et seq.

Coastal Zone Management Act, as amended, 16 USC 1451 et seq. July 1998.

Council on Environmental Quality (CEQ). “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” 46 *Federal Register* 18026-18037, March 23, 1981.

Endangered Species Act, as amended, 16 USC 1531 et seq. July 1998.

Energy Reorganization Act, as amended, 42 USC 5801 et seq.

Executive Order 12898. “Federal Actions to Address Environmental Justice in Minority and Low-Income Population.” 59 *Federal Register*: 9629-7633 (1994).

Limerick Ecology Action vs. NRC 869 F. 2d 719 (3rd Cir. 1989)

National Environmental Policy Act of 1969, as amended, 42 USC 4321 et seq.

National Historic Preservation Act, as amended, 16 USC 470 et seq. July 1998.

U.S. Nuclear Regulatory Commission (NRC). 1976. Regulatory Guide 4.2, Rev. 2. *Preparation of Environmental Reports for Nuclear Power Stations*.

U.S. Nuclear Regulatory Commission (NRC). 1978. *Environmental Standard Review Plans for the Environmental Review of Construction Permit Applications for Nuclear Power Plants*. NUREG-0555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1987. *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plant*. NUREG-0800, U.S. Nuclear Regulatory Commission, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1989a. *Comanche Peak 1 and 2 Operating License Review*, NUREG-0775, Final Environmental Statement, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1989b. *Limerick 1 and 2 Operating License*, NUREG-0974, Final Environmental Statement, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1989c. *Project Manager’s Handbook*, NUREG/BR-0073, Rev. 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1995. *Final Environmental Impact Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2*. NUREG-0498, Supplement No. 1, Docket Nos. 50-390 and 50-391, Tennessee Valley Authority, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Vol. 1, U.S. Nuclear Regulatory Commission, Washington, D.C.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (NRC/NRR). 1996. "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues." NRR Office Letter No. 906, Revision 1, U.S. Nuclear Regulatory Commission, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. Regulatory Guide 4.7, Rev. 2. *General Site Suitability Criteria for Nuclear Power Stations*.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999c. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 603—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437 Vol. 1, Addendum 1, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL
 STANDARD
 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

1.0 SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT INTRODUCTION

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for supplemental environmental impact statements (SEISs) for license renewal. Nuclear Regulatory Commission regulations (10 CFR 51.95[c]) require preparation of a site-specific environmental impact statement, which is a supplement to the Commission's NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), in connection with the renewal of an operating license.

The scope of this supplement is to (1) outline the purpose and organization of the SEIS and (2) introduce the material to be presented from the reviews conducted under supplemental ESRPs (ESRP/S1s) 1.1 through 1.4.

Review Interfaces

The reviewer for this ESRP should provide input to the reviewer for the following ESRP:

- ESRP/S1 1.4. Provide a list of the references cited in the SEIS.

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The reviewer for this ESRP should obtain the proposed organizational structure of the SEIS from the Environmental Project Manager. The structure of the SEIS should be consistent with the structure of NUREG-1437, should explicitly address each of the issues listed in Table B-1 of Appendix B, Subpart A to 10 CFR 51, and should contain site-specific analyses of the issues listed in 10 CFR 51.53(c)(3)(ii)(A) through 10 CFR 51.53(c)(3)(ii)(L) that are relevant to the plant.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introduction prepared under this ESRP is consistent with the requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports at the license renewal stage and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of a draft SEIS at the license renewal stage
- 10 CFR 51.95(c) with respect to preparation of a final SEIS at the license renewal stage
- 10 CFR 51, Subpart A, Appendix A with respect to the format and content of an EIS
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant-specific analyses are required.
- NUREG-1437, Vol. 1, Addendum 1 (NRC 1999c). Supplements the staff's generic conclusions related to the environmental impacts of transportation of spent nuclear fuels and provides the basis for removal of 10 CFR 51.53(c)(3)(ii)(M).
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing environmental reports (ERs) associated with applications under 10 CFR 50 and 52. It contains review procedures that may be helpful in reviews for the specific environmental issues addressed in ERs associated with license renewal.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with applications for license renewal under 10 CFR 54.

Technical Rationale

The technical rationale for evaluating the applicant's environmental report is discussed in the following paragraphs:

The Commission has assessed the environmental impacts of renewing the operating license for a nuclear power plant. The results of this assessment are presented in NUREG-1437, and the findings are summarized in Appendix B to Subpart A of 10 CFR 51. The Commission could not make a generic determination for all of the issues addressed in NUREG-1437. There are 24 issues that require plant-specific reviews for some or all plants. These issues are identified in Table B-1 of Appendix B, and the required analyses are called out in 10 CFR 51.53(c)(3)(ii).

The information that must be included in an EIS prepared by the Commission to meet its responsibilities under NEPA is listed in 10 CFR 51, Subpart A, Appendix A. The format for an EIS may expand upon or differ from the format suggested in 10 CFR 51, Appendix A. Therefore, the introduction should describe the format of the SEIS and relate it to the format suggested in Appendix A and the format followed in the NUREG-1437.

Introductory paragraphs that orient the reader with respect to the relevance of material to overall organization and goals of the SEIS add clarity to the presentation. They should also bring prior environmental documents related to the plant to the attention of the reader.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature; no specific analysis of the data is required. However, the reviewer should, with the assistance of the applicant, identify all final environmental documents for the plant previously prepared by the staff.

IV. EVALUATION FINDINGS

The reviewer for this ESRP should prepare introductory paragraphs for the SEIS. The first paragraph(s) should state the purpose of the SEIS, describe the organization and format of the SEIS, and relate that information to the format presented in 10 CFR 51, Appendix A and the format of NUREG-1437. The next group of paragraphs should identify other final environmental documents for the plant that have been prepared by the staff. Following these paragraphs, there should be a paragraph that introduces the information to be presented by the reviewers of information covered by ESRP/S1s 1.1 through 1.4. This paragraph should list the types of information to be presented and describe their relationships to information to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix A, "National Environmental Policy Act—Regulations Implementing Section 102(2)."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999c. *Generic Environmental Impact Statement for License Removal of Nuclear Plants: Main Report Section 6.3—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437, Vol. 1, Addendum 1, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
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OFFICE OF NUCLEAR REACTOR REGULATION

1.1 PROPOSED FEDERAL ACTION

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of paragraphs for supplemental environmental impact statements (SEISs) for license renewal that describe the proposed Federal action. The proposed Federal action for license renewal was described in NUREG-1437 (NRC 1996), *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the paragraphs covered by this plan is to (1) provide a statement of the proposed Federal action for the SEIS and (2) provide background information related to the regulatory basis for license renewal.

Review Interfaces

The reviewer for this ESRP should provide input to the reviewer for the following supplemental ESRP (ESRP/S1):

- ESRP/S1 1.4. Provide a list of the references cited in the SEIS.

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The reviewer for this ESRP should obtain a copy of that portion of NUREG-1437 that describes the Federal action and the bases for the Federal action. The reviewer should also obtain those portions of the applicant's ERs submitted for the plants (including the ERs at the construction permit and operating license stages).

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introduction prepared under this ESRP is consistent with the requirements of the following regulations:

- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language
- 10 CFR 51, Subpart A, Appendix A with respect to the format and content of an EIS.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 provides a description of the Federal action and cites portions of 10 CFR Parts 51 and 54 related to the Federal action.

Technical Rationale

The technical rationale for evaluating the applicant's environmental report (ER) is discussed in the following paragraphs:

Renewal of a plant operating license is defined in 10 CFR 51 as a major Federal action that requires preparation of an EIS. The introductory paragraphs prepared under this ESRP should clearly define the action and provide the readers of the SEIS with background information related to license renewal. This information is summarized in NUREG-1437.

Introductory paragraphs that orient the reader with respect to the relevance of material to overall organization and goals of the SEIS add clarity to the presentation. They should also bring to the attention of the reader prior environmental documents related to the plant.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature; no specific analysis of the data is required. Much of the required material may be taken directly from NUREG-1437. However, the reviewer should reflect the applicant's schedule for activities in preparation for license renewal, including refurbishment.

IV. EVALUATION FINDINGS

The reviewer for this ESRP should prepare several introductory paragraphs for the SEIS. The first paragraph should clearly state the nature of the proposed Federal action. The remaining paragraphs should describe the regulatory bases for license renewal, outline the process of license renewal, and outline the applicant's process.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51, Subpart A, Appendix A, "National Environmental Policy Act—Regulations Implementing Section 102(2)."

10 CFR 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of paragraphs for supplemental environmental impact statements (SEISs) for license renewal that describe the purpose and need for the proposed action. The Commission has adopted a standard definition of purpose and need. The definition is found in the Section 1.3 of NUREG-1437 (NRC 1996), *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996). The scope of the paragraphs covered by this plan is to present the definition.

Review Interfaces

The reviewer for this ESRP should provide input to the reviewer for the following supplemental ESRP (ESRP/S1):

- ESRP/S1 1.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP should obtain a copy of Section 1.3 of NUREG-1437 that contains the Commission's definition of purpose and need.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introduction prepared under this ESRP is consistent with the requirements of the following regulations:

- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language
- 10 CFR 51, Subpart A, Appendix A with respect to the format and content of an EIS.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, Section 1.3 contains the Commission's definition of purpose and need related to license renewal.

Technical Rationale

The technical rationale for the purpose and need section of the SEIS is discussed in the following paragraph:

Renewal of a plant operating license by the NRC is just one of the conditions required for continued operation of a nuclear power plant beyond the term of the initial license. Granting a license renewal application will provide the plant operator and other regulatory agencies with the option of extending plant operation should circumstances warrant it, whereas denial of the application eliminates this option. Therefore, the Commission has defined the purpose and need for license renewal in terms of providing the plant operator and other regulators with the option of extending plant life. One or more introductory paragraphs should be prepared that present the Commission's definition of purpose and need.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature; no specific analysis of the data is required.

IV. EVALUATION FINDINGS

The reviewer for this ESRP should prepare one or more introductory paragraphs for the SEIS. The reviewer should include the Commission's definition of purpose and need for license renewal as it appears in Section 1.3 in NUREG-1437 in the paragraphs prepared under this ESRP.

The Commission has adopted the following definition of purpose and need: the purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power

generation capability beyond the term of a current nuclear power plant operating license to meet future system generator needs, as such needs may be determined by state, utility, and, where authorized, Federal (other than NRC) decision makers.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51, Subpart A, Appendix A, "National Environmental Policy Act—Regulations Implementing Section 102(2)."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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1.3 COMPLIANCE AND CONSULTATIONS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's identification and assessment of environmentally related authorizations^(a) required by Federal, State, regional, local, and affected Native American tribal agencies.

The scope of the review includes (1) identification of the authorizations and the authorizing agencies that address environmental issues, (2) determination of status of the authorization, (3) identification of environmental concerns, (4) identification of consultations undertaken pursuant to license renewal, and (5) the status of consultations. This environmental review should be used by the reviewers for supplemental ESRP (ESRP/S1) Chapters 3 and 4 to help identify areas of environmental concern and determine applicant compliance with existing standards and regulations.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following ESRPs, as indicated:

-
- (a) As used in this ESRP, the term "authorizations" includes consideration of reviews and approvals that might be conducted by other agencies or organizations.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 1.4. Provide a list of the references cited in the SEIS.
- ESRP/S1 Chapters 3 and 4. Provide updated lists of environmentally related authorizations required by Federal, State, regional, local, and affected Native American tribal agencies based on the information in the environmental report (ER). The lists should include the status of the authorization, environmental concerns identified by the agencies, and potential administrative problems.

Data and Information Needed

The reviewer for this ESRP should develop a list of the environmentally related authorizations required by Federal, State, regional, local, and affected Native American tribal agencies. The following information may be needed:

- the name of each related authorization, including the responsible agency and the applicable law, ordinance, or regulation (from the ER)
- the principal environmental factors to be covered by the authorization (from the ER)
- the date of issuance (if the authorization has been issued) of each authorization (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- the current status of each authorization (from consultation with Federal, State, regional, local, and affected Native American tribal agencies).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of environmental approvals and consultations are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(d) with respect to the requirement for applicants to list all Federal permits, licenses, approvals, and other entitlements that must be obtained in connection with the proposed action and to discuss the status of compliance with applicable environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.70 with respect to the requirement that NRC staff independently evaluate and be responsible for the reliability of all information used
- 10 CFR 51.71(c) with respect to the requirement that the environmental impact statement (EIS) list all Federal permits, licenses, approvals, and other entitlements that must be obtained in implementing the proposed action, and discuss the status of compliance with those requirements
- 10 CFR 51.95(c) with respect to the requirement that the supplemental EIS prepared at the operating license renewal stage address those issues required by 10 CFR 51.71.

Regulatory positions and specific criteria necessary to meet the regulations identified above are as follows:

- There are no regulatory positions specific to this ESRP.

Technical Rationale

The technical rationale for evaluating the status of permits, licenses, approvals, and other entitlements applicable to the applicant's plant is discussed in the following paragraph:

Responsibility for protection of the environment has been assigned to many agencies. The NRC staff is required by the referenced sections of 10 CFR 51 to consider in its analysis of environmental impacts the concerns and requirements of other governmental agencies that have regulatory authority.

III. REVIEW PROCEDURES

The basic list and status of authorizations can be obtained from the applicant's ER to guide the reviewer. The reviewer should take the following steps:

- (1) Consult the reviewers of ESRP/S1 Chapters 2 through 7 to determine
 - if any authorizations should be added to those identified in the applicant's ER
 - which of the authorizations have to do with environmental concerns.
- (2) For each such environmentally related authorization, establish the following:
 - current status of the authorization
 - environmental concerns of the authorizing agency
 - administrative requirements of the authorizing agencies.

IV. EVALUATION FINDINGS

Appendix A to this plan provides a sample format for including a list of the status of authorizations relevant to this ESRP. In some circumstances, the reviewer may need to prepare additional information to fully cover the subject material.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.45, "Environmental report."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

APPENDIX A

SAMPLE FORMAT FOR ESRP/S1 1.3

The applicant's ER provided a status listing of related authorizations required from Federal, State, regional, local, and affected Native American tribal agencies in connection with the plant. The staff has reviewed the listing and consulted with the appropriate agencies in an effort to identify any significant environmental issues of concern to the reviewing agencies. The status of the appropriate authorizations is summarized in Table 1.3-1.

Table 1.3-1. Federal, State, and Local Authorizations

| Agency | Authority | Requirement | Permit Number | Permit Expiration or Consultation Date | Activity Covered |
|---|------------------------------------|---------------|---------------|--|---|
| U.S. EPA or State | Clean Water Act | NPDES permit | xxxx | | Discharge of process waste water |
| State water or natural resources agency | | Authorization | | | Allocation for consumptive water use |
| U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service | Endangered Species Act | Consultation | NA | | Potential impacts on endangered and threatened species during refurbishment and operation during the renewal term |
| State Historic Preservation Office | National Historic Preservation Act | Consultation | NA | | Potential impacts on historic sites during refurbishment and operation during the renewal term |
| U.S. EPA or State | Clean Air Act | Permit | xxxx | | Air emissions |



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1.4 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS introduction.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 1.0 through 1.3. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant-specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for license renewal is submitted. In NUREG-1437 reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1s 1.0 through 1.3 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer for this ESRP should prepare the SEIS section that lists references cited in the SEIS introduction. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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**2.0 DESCRIPTION OF NUCLEAR POWER PLANT AND SITE AND PLANT INTERACTION
 WITH THE ENVIRONMENT**

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes the nuclear power plant, the site, and plant interaction with the environment.

The scope of the paragraphs covered by this plan is to introduce the material from the reviews conducted under supplemental ESRPs (ESRP/S1s) 2.1, 2.2, and 2.3. These SEIS sections should provide the descriptive information needed for the analyses of potential environmental impacts that are presented in subsequent SEIS chapters.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRPs:

- ESRP/S1s 2.1 and 2.2. Obtain information related to the plant, site, environment, and license renewal that should be highlighted in introductory paragraphs.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The reviewer for this ESRP should obtain an outline of the SEIS organization from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses at the license renewal stage
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of the draft EIS at the license renewal stage
- 10 CFR 51.95(c) with respect to preparation of a final SEIS at the license renewal stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant specific analyses are required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of the plant and site is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required.

It may be appropriate to direct the reader's attention to specific sections of SEIS Chapter 2 that provide background information on environmental issues that have been raised by the public in scoping meetings or in correspondence related to the license renewal application.

IV. EVALUATION FINDINGS

The reviewer for this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers for ESRP/S1s 2.1 and 2.2. The paragraph(s) should list the types of information to be presented and describe their relationships to information to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.1 PLANT AND SITE DESCRIPTION AND RENEWAL-TERM PLANT OPERATION

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section introducing sections prepared by the staff that describe the plant, plant refurbishment activities, and plant operations during the renewal term based on the reviews conducted under supplemental ESRPs (ESRP/S1s) 2.1.1 through 2.1.7.

The scope of the review directed by this plan includes (1) review of the general discussion of nuclear plants in NUREG-1437 (NRC 1996), *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), (2) review of the SEIS sections prepared by reviewers for ESRP/S1s 2.1.1 through 2.1.7, and (3) preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRPs:

- ESRP/S1 2.0. Provide a list of the features related to the plant, site, plant refurbishment, and operation during the renewal period that warrant highlighting.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1s 2.1.1 through 2.1.7. Obtain lists of features related to the plant, site, plant refurbishment, and operation during the renewal period that warrant highlighting.
- ESRP/S1 2.3. Provide a list of the references cited.

Data and Information Needs

The reviewer for this ESRP should obtain an outline of the SEIS organization from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of the draft SEIS at the license renewal stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the license renewal stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant specific analyses are required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for describing the applicant's plant and site during the license renewal term description is discussed in the following paragraph:

Introductory paragraphs orient the reader with respect to the current plant and site, plant refurbishment plans, and operation during the renewal term.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required.

The paragraph(s) should list the types of information to be presented and describe their relationships to information to be presented later in the SEIS. They should indicate that the objectives of SEIS subsections 2.1.1 through 2.1.7 are to describe the site, the plant, and plant operations under the current license and to describe the changes in the site, the plant, and in plant operations associated with refurbishment and operation during the renewal term.

It may be appropriate to direct the reader's attention to specific subsections of the SEIS that provide information related to environmental issues that have been raised by the public in scoping meetings or in correspondence on the license-renewal application.

IV. EVALUATION FINDINGS

The reviewer for this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers for ESRP/S1s 2.1.1 through 2.1.7. The depth and extent of the input to the SEIS will be governed, in part, by the extent of the potential impacts of refurbishment and operation during the renewal term.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.1.1 EXTERNAL APPEARANCE AND SETTING

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the layout and appearance of the established plant, its existing station structures, any related offsite structures, and any proposed new structures.

The scope of the review directed by this plan includes description of the location, area, orientation of principal structures, site boundaries, exclusion areas, restricted areas, and transportation routes adjacent to the site. This review should provide background information used in other reviews evaluating effects of refurbishment on land use and continued plant operations.

The plant layout and other figures should be referenced in the SEIS sections when referring to the location of the plant or station structures.

Review Interfaces

October 1999

2.1.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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The reviewer for this ESRP should provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

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2.1.1-2

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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- ESRP/S1s 2.2.1 through 2.2.8. Provide the station description, the site layout, and the transmission corridors as a basis for establishing a geographic point of reference for environmental analysis.
- ESRP/S1 2.3. Provide a list of the references cited.
- ESRP/S1s 3.1 and 3.6.4. Provide descriptive information sufficient to support land-use assessments.
- ESRP/S1s 3.3, 3.4, 4.1.1 through 4.1.5, and 4.5.1 through 4.5.4. Provide descriptions of the plant layout with respect to the main water bodies and locations of intakes and discharges.
- ESRP/S1s 3.6.1 through 3.6.7 and 4.4.1 through 4.4.6. Provide descriptive information sufficient to support the socioeconomic assessment.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a copy of environmental reports (ERs) and final EISs prepared for the plant
- a description of the station, including the site's location in terms of State, county, latitude and longitude Universal Transverse Mercator (UTM) coordinates, township, range, and sections
- a map of the site and vicinity showing site boundaries, exclusion area, current site structures and facilities, major land uses (with classifications consistent with U.S. Geological Survey [USGS] categories—USGS 1997), the construction zone for refurbishment, if any, and sites for any other planned buildings and structures (both temporary and permanent)
- a map of the site vicinity within a 10-km (6 mi) radius of the plant showing county and local municipality boundaries, place names, residential areas, airports, industrial and commercial facilities, roads, railroads, major land uses, utility rights-of-way, rivers and other bodies of water, wetlands, designated Federal, State, and local parks and natural areas, trust lands, historic and archaeological sites, Native American tribal lands, and military reservations
- a map of the region within an 80-km (50-mi) radius of the plant showing major civil divisions, highways, transmission corridors serving the plant, rivers and other bodies of water, designated Federal, State, regional, and local parks and natural areas, trust lands, historic and archaeological sites, Native American lands, military reservations, and nonattainment and maintenance areas defined under the Clean Air Act, as amended.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework of the site to support the discussions of the affected environment.

Regulatory positions and specific criteria to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing environmental reports (ERs) associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's external appearance and setting description is discussed in the following paragraph:

A description of the overall appearance of the facility and its setting is needed to clarify the physical parameters of the current power station and any significant modifications to the facility. The description of the external appearance of the plant and plant layout should be in sufficient detail to form an adequate basis for staff analysis of various land-use and socioeconomic impacts of plant refurbishment and continued operation.

III. REVIEW PROCEDURES

The reviewer should ensure that description of the plant layout in relation to its surrounding environment provides adequate information for the reviews conducted under the ESRP/S1s in Chapters 3 and 4.

When preparing the description of the external appearance and setting, the reviewer should do the following:

- (1) Review plant and station layout and external appearance data to the extent needed to prepare a description of the plant and station. This may include visiting the site to ensure that the major features of the site and station have been recorded and that the descriptive material to be used in the SEIS is correct.
- (2) Determine the relationship of the plant design and layout to the surrounding environment, including any aesthetic amenities of the site and vicinity and changes that might be caused by refurbishment or other planned construction.
- (3) Identify maps and drawings that show relevant features of the plant, the site, and the region. The maps and drawings should also identify significant local facilities, if any, in the site vicinity (i.e., large business establishments with a high degree of visitor use, recreation areas, other public-use facilities, or *National Register* properties).

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS should be governed by land-use considerations that could be affected by station layout and by the nature and magnitude of proposed refurbishment or other facility modifications. The information that should usually be included in the SEIS is described above.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

Clean Air Act, as amended, 16 USC 1451 et seq.

U.S. Geological Survey (USGS). 1997. "USGS Land Use and Land Cover Data," USGS Survey Earth Resources Observation Data Center, Sioux Falls, South Dakota.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.1.2 REACTOR-POWER CONVERSION SYSTEM

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the reactor and electric generating equipment.

The scope of the review directed by this plan includes the type(s) and size(s) of reactors and electrical generating equipment and their major performance parameters. Refurbishment or other modifications proposed for the reactor system for continued operations should be described. This information should support subsequent environmental reviews that assess the impacts of refurbishment and operation during the renewal term.

Review Interfaces

The reviewer for this ESRP should provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.

October 1999

2.1.2-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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- ESRP/S1s 5.1, 6.1, 6.2.1, and 6.3. Provide data on the basic reactor, fuel, and irradiation level in support of the analysis of postulated accidents, fuel cycle and transportation impacts, and generation and storage of radioactive waste.

October 1999

2.1.2-2

NUREG-1555, Supplement 1

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- the number of units and description of each reactor, including type, e.g., boiling-water reactor (BWR), pressurized-water reactor (PWR), power conversion system manufacturer, fuel assembly description, total quantities of uranium, and percentage U-235 enrichment (from the environmental report [ER])
- engineered safety features
- the historic average irradiation level of spent fuel, in megawatt days/ton (from the ER)
- the rated and design core thermal power, the rated and design gross electrical output, and the rated and design net electrical output in megawatts (MWe). (The rated power is defined as the power level at which each reactor is operated, and the design power is defined as the highest power level that would be permitted by plant design. The gross electrical output is the power level measured at the output terminals of the generator and expressed in MWe. The net unit electrical output is equal to the gross electrical output minus the nominal service and auxiliary loads [from the ER].)
- a simplified flow diagram for the reactor-power conversion system (from the ER).

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to providing a descriptive framework of the number of units, type, and thermal power level to support the discussions of the affected environment
- 10 CFR 51.52 with respect to criteria related to plant-specific analysis of the effects from transportation of fuel and waste from the facility. Note: Generic determinations have been made that the impacts in Table S-4 are bounding for fuel with uranium enrichment of up to 5% by weight irradiated to 62,000 megawatt days per ton, provided that fuel is shipped more than 5 years after discharge from the reactor.

Regulatory positions and specific criteria necessary to meet the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996; NRC 1999c), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where reactor systems analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for description of the applicant's reactor system is discussed in the following paragraph:

A description of the overall nuclear energy generating system is crucial background information to the evaluation of certain environmental impacts resulting from refurbishment and the continued plant operations. The reactor type, number of units, thermal power level, and other factors influence the size and the performance of the facility and are required input to assessment of the environmental impacts of the plant operation, transportation of fuel and waste, and the commitment of resources.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature; no specific analysis of the data is required. Because this material is for description only, ensure that adequate information is available to meet the purpose and scope of this supplement ESRP. Identify the reactor power conversion and engineered safety feature systems and the basic design performance data. As a rule, if the data listed under "Data and Information Needs" above are provided, that objective will be met.

IV. EVALUATION FINDINGS

The input to the SEIS should include a summary description of the reactor-power conversion and engineered safety feature systems, a flow diagram, and a table of design and performance parameters. The reviewer should verify that sufficient information has been provided in accordance with the relevant requirements for staff analysis of postulated accidents, fuel use and transportation, and waste-disposal issues.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.52, "Table S-4, Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor."

10 CFR 51.53, "Postconstruction environmental reports."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999c. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437 Vol. 1, Addendum 1, Washington, D.C.



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2.1.3 COOLING AND AUXILIARY WATER SYSTEMS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the plant's cooling system and its auxiliary water systems.

The scope of the review directed by this plan should include (1) a general description of the cooling system and modes of operation, (2) the intake and discharge locations and structures, (3) the auxiliary system, (4) performance characteristics for these systems, and (5) any proposed changes to these systems during refurbishment or the renewal term. The description to be provided by this review should be in sufficient detail to support subsequent staff assessment of environmental impacts related to cooling system modification during refurbishment or operation during the renewal term.

Reviewer Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.2.2 and 2.2.3. Provide a description of the cooling and auxiliary water systems and their water volume requirements.

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2.1.3-1

NUREG-1555, Supplement 1

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Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1s 3.3, 3.4, 4.1, and 4.1.1 through 4.1.5. Provide a description of the cooling system and its operational modes and the auxiliary water system and plant-intake system.
- ESRP/S1s 4.1.4 and 4.1.5. Provide information on the location of thermal discharges and thermal plumes from the cooling-effluent system.
- ESRP/S1 4.5.2. Provide a description of the cooling tower and cooling pond seasonal makeup water requirements if applicable.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a system description, including the water supply source and intake and discharge locations and structures
- descriptions of heat-dissipation operational modes and the periods of time that the system has historically operated in each mode
- for each operational mode, the quantities of heat generated, dissipated to the atmosphere, and released in liquid discharges
- for each operational mode, identification of the water source and quantities of water withdrawn, consumed, and discharged
- monthly variation and stratification for the body of water used for cooling intake and discharge
- descriptions of changes to the cooling system during refurbishment or the renewal term or to cooling-system operational modes during the renewal term.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework of the cooling water and auxiliary systems, their water requirements, and intakes and discharges to support the discussions of the affected environment.

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Regulatory positions and specific criteria necessary to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where cooling system analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing environmental reports (ERs) associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of the cooling and auxiliary systems and operational modes with respect to refurbishment and renewal term operations is discussed in the following paragraph:

The cooling system presents a major source of interaction with the environment and of possible impacts. This section is descriptive in nature and presents information necessary for the evaluation of environmental impacts associated with cooling system modification related to license renewal and operation during the renewal term. The description of the external appearance of the cooling system and its operational modes should be in sufficient detail to form an adequate basis for staff analysis of environmental impacts of refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The material to be prepared on the cooling system and auxiliary description and operational modes is informational in nature. No specific analysis is required, but the use of tables such as 2.1.3-1 and 2.1.3-2 may assist data organization. The reviewer should gather the following information largely from design and historical documentation for use in later sections:

- For the general cooling system description include
 - type and configuration
 - water source and proximity to facility

- modes of operation and percentage of time, water source and quantities of water withdrawn, consumed, and discharged in each mode
 - specific details depending on system type (see Tables 2.1.3-1 and 2.1.3-2)
 - monthly variation and stratification for the body of water used for cooling intake and discharge
 - other major plant systems and flow rates
- For intake systems include
 - a drawing of the intake structure showing the relationship of the structure to the water surface, bottom geometry, and shoreline (from the environmental report [ER]) being handled generically
 - the location of the intake with respect to the outfall (from the ER)
 - a description of cooling-water pumping facility (from the ER)
 - a description of the trash racks, traveling screens, trash baskets, and fish return devices (from the ER)
 - performance characteristics (e.g., flow rates, intake velocities) for the operational modes identified (from the ER)
 - performance characteristics for specific intake related functions, such as de-icing, trash rack clearing, screen washing, trash basket removal, or fish return system operation (from the ER)
 - the location and description of components for the addition of chemicals (e.g., corrosion inhibitors, antifouling agents) to the intake system (from the ER).
 - For discharge systems include
 - drawings of the outfall structure, showing its location in the receiving water body, relationship to water surface, bottom geometry, and shoreline (from the ER)
 - a description of discharge canal or discharge lines (from the ER)
 - performance characteristics (e.g., discharge flow rates, discharge velocities, discharge temperatures, and temperature differentials) for the operational modes identified (from the ER)
 - descriptions of specific discharge related components (e.g., diffusers, fish barriers) (from the ER)

- For heat-dissipation systems include
 - the location of heat-dissipation system components relative to other site features (from the ER)
 - the design details of heat-dissipation system components affecting system performance
 - heat-dissipation system performance characteristics for the operational modes
 - site-specific meteorological data (from ESRP/S1 2.2.4)
 - site-specific water supply data (from ESRP/S1 2.2.2)
- For cooling towers, determine average discharge temperatures for each month of the year using cooling tower performance curves. The average discharge temperature will be calculated by using the average wet-bulb temperature for the month.
- For spray systems, analyze the applicant's estimates of average monthly discharge temperatures. The depth and extent of this analysis should depend on the seriousness of the predicted impacts of the heated effluent on the receiving body of water and the level of confidence in the applicant's model.
- In the cases where auxiliary systems are employed to further cool the blowdown discharged from the main cooling system, determine the final discharge temperature.

Table 2.1.3-1. Design Details of Heat-Dissipation-System Components

| Component | Design Details |
|---------------------------------------|---|
| Cooling towers (from the ER) | Type Configuration Materials of construction Number and arrangement Rated heat-dissipation capacity |
| Cooling lakes and ponds (from the ER) | Surface area Volume Bathymetry |
| Spray ponds or canals (from the ER) | Arrangement and configuration of spray modules Pond or canal geometry Surface area and water volume |
| Condenser (from the ER) | Heat transfer area and materials of construction Antifouling treatment |

Table 2.1.3-2. Performance Characteristics of the Heat-Dissipation System

| Component | Design Details |
|---------------------------------------|--|
| Cooling towers (from the ER) | Input and discharge flow rates and temperatures for monthly average meteorological conditions Wet-bulb temperature, approach to wet-bulb, and range Performance curves Air flow Power consumption Noise levels Drift rate and drop size |
| Cooling lakes and ponds (from the ER) | Flow rates (through condenser) Flow-through times Flow pattern Monthly average water temperatures (mean for entire lake or pond, inlet [from condenser], outlet [to condenser]) Surface elevation (mean, maximum, minimum) |
| Spray ponds or canals (from the ER) | Flow rates (through condenser) Flow-through times Flow pattern Monthly average water temperatures (inlet [from condenser], outlet [to condenser]) Surface elevation (mean, maximum, minimum) Spray system operating parameters (e.g., power consumption, drop size) |
| Once-through systems (from the ER) | Condenser flow rate Temperature differential across condenser Time-of-passage through system (including intake and discharge system passage times) |

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the characteristics of the cooling system and plant primary and alternative operational modes. The level of detail of information included in the SEIS should be scaled according to the anticipated magnitudes of the expected impacts. The following information should be included in the EIS:

- narrative description of the cooling system and the intake and discharge structures and characteristics

- sketches of intake, discharge, and heat-dissipation components
- description of operational modes and their important characteristics (e.g., frequency and duration, discharge temperature, water consumption, and chemical concentration factor)
- drawings of important subsystems (e.g., perforated-pipe assemblies).

The reviewer should verify that cooling system component descriptions are consistent, accurate, and given in sufficient detail to serve the needs of the reviewers of intake, discharge, and heat-dissipation system impacts.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.53, "Postconstruction environmental reports."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission. 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.1.4 RADIOACTIVE WASTE MANAGEMENT AND EFFLUENT CONTROL SYSTEMS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the applicant's radioactive waste management and effluent control systems.

The scope of the review includes describing the existing systems, describing any changes to the systems to be made during refurbishment or the renewal term, and listing the radioactive effluent release points.

Review Interfaces

The reviewer for this ESRP should provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.2.4 and 2.2.7. Provide descriptions of potential release points for radioactive effluents.
- ESRP/S1s 2.2.7. Provide descriptions of liquid and gaseous radioactive waste management and effluent control system.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.

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2.1.4-1

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1s 3.2.1 and 3.7. Provide descriptions of potential points for release of radioactive materials during refurbishment, if any and during the renewal term.
- ESRP/S1 4.3. Provide descriptions of changes in release points for radioactive materials for operation during the renewal term, if any.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the liquid and gaseous radioactive waste management and effluent control systems (from the updated Final Safety Analysis Report (FSAR) or applicants Offsite Dose Calculation Manual [ODCM])
- identification of sources of radioactive liquid and gaseous waste material within the plant (from the updated FSAR)
- identification of principal release points for radioactive materials to the environment (from the applicant's ODCM)
- identification of direct radiation sources stored onsite out-of-plant as solid waste (e.g., independent fuel storage) (from the updated FSAR or applicants ODCM)
- information on the radiological impacts of refurbishment (from the site visit)
- information on the changes in radiological impacts from operation that are expected during the renewal term (from the site visit).

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework of the radioactive waste management and effluent control systems to support the discussions of the affected environment.

Regulatory positions and specific criteria necessary to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license

renewal and describes the expected environmental impacts of the radioactive waste management and effluent control systems.

- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing environmental reports associated with license applications under 10 CFR Parts 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for describing the radioactive waste management and effluent control systems is discussed in the following paragraph:

The radioactive waste management and effluent control systems are a source of interaction with the environment and of possible adverse environmental impacts. This section is descriptive in nature and presents information necessary for the evaluation of environmental impacts associated with the radioactive waste management and effluent control systems. The descriptions should be in sufficient detail to form an adequate basis for staff analysis of environmental impacts of refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The material to be prepared on the radioactive waste management and effluent control systems is informational in nature. No specific analysis is required. The following review steps are suggested:

- (1) Review the discussion of radioactive waste management and effluent control systems in Section 2.2.4 of NUREG-1437.
- (2) Obtain a description of the radioactive waste management and effluent control systems for the applicant's plant. The description should include identification of release points.
- (3) Obtain information on planned changes to the radioactive waste management and effluent control systems during refurbishment, if any.
- (4) Obtain information on changes to the radioactive waste management and effluent control systems that would affect releases and exposures from operations during the renewal term, if any.
- (5) Prepare a section describing the radioactive waste management and effluent control systems for the SEIS. This section should include general descriptions of gaseous, liquid, and solid waste processing

systems. It should also generally describe the applicant's gaseous and liquid effluent monitoring systems.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will depend on site-specific factors. The level of detail of information included in the SEIS should be scaled according to the anticipated magnitudes of the expected impacts. The reviewer should verify that the radioactive waste management and effluent control system descriptions are consistent, accurate, and given in sufficient detail to serve the needs of the reviewers for ESRP/S1s in Chapters 3, 4, and 5.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.53, "Postconstruction environmental reports."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*.



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2.1.5 NONRADIOACTIVE WASTE SYSTEMS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the applicant's nonradioactive waste systems.

The scope of the review includes describing the existing systems, describing any changes to the systems to be made during refurbishment or the renewal term, and listing the effluent release points.

Review Interfaces

The reviewer for this ESRP should provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.2.3 and 2.2.5. Provide a description of waste stream discharge points and historical composition of effluents released.
- ESRP/S1s 3.3, 3.4, and 3.5. Provide a description of liquid effluent release and solid waste production during refurbishment, if any.

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2.1.5-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the nonradioactive effluent treatment systems (from the environmental report [ER] and previous EISs)
- identification of sources of nonradioactive liquid and solid waste material within the plant (from the ER)
- identification of principal discharge points for nonradioactive materials to the environment and historical information on composition of discharges (from the ER)
- information on the nonradiological waste impacts of refurbishment (from the ER)
- information on the changes in nonradiological waste impacts from operation that are expected during the renewal term (from the ER).
- documentation of consultation with agencies responsible for permitting nonradioactive waste systems for atmospheric, liquid, or solid effluents (e.g., NPDES).

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework of the nonradioactive effluent treatment systems to support the discussions of the affected environment.

Regulatory positions and specific criteria necessary to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and describes the expected environmental impacts of the nonradioactive waste and effluent-control systems.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for describing the nonradioactive-waste systems is discussed in the following paragraph:

The nonradioactive waste (chemicals and biocides, sanitary wastes, and other waste effluents) and waste-treatment systems are a source of interaction with the environment and of possible adverse environmental impacts. This section is descriptive in nature and presents information necessary for the evaluation of environmental impacts associated with the nonradioactive wastes and effluent control systems. The descriptions should be in sufficient detail to form an adequate basis for staff analysis of environmental impacts of refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The material to be prepared on the radioactive waste management and effluent control systems is informational in nature. No specific analysis is required. The following review steps are suggested:

- (1) Review the discussion of nonradioactive waste systems in Section 2.2.5 of NUREG-1437.
- (2) Obtain a description of the nonradioactive wastes and effluent control systems for the applicant's plant. The description should include identification of release points.
- (3) Obtain information on planned changes to the nonradioactive waste and effluent control systems during refurbishment, if any.
- (4) Obtain information on changes to the nonradioactive waste and effluent control systems that would affect releases from operations during the renewal term, if any.
- (5) Prepare a section describing the nonradioactive waste and effluent control systems for the SEIS.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will depend on site-specific factors. The level of detail of information included in the SEIS should be scaled according to the anticipated magnitudes of the expected impacts. The reviewer should verify that the nonradioactive waste and effluent control system descriptions are consistent, accurate, and given in sufficient detail to serve the needs of the reviewers for ESRP/S1s in Chapters 3 and 4.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.53, "Postconstruction environmental reports."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*.



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2.1.6 PLANT OPERATION AND MAINTENANCE

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the operation and maintenance of the applicant's plant.

The scope of the review includes a description of the plant staffing and operating experience (outages and annual capacity), and a description of changes in operation and maintenance associated with refurbishment or operation during the renewal term.

Review Interfaces

The reviewer for this ESRP should provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.2.8. Provide a description of plant staffing and the plant operating cycle.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS section prepared under ESRP/S1 2.1.6-1.

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2.1.6-1

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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- ESRP/S1s 3.1, 3.2.1, and 3.6.1 through 3.6.7. Provide a description of estimated plant staffing during refurbishment.

- ESRP/S1s 4.4.1 through 4.4.6. Provide an estimate of plant staffing during the renewal term.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the plant's operational history, including refueling schedule (from the environmental report [ER])
- plant staffing history, including maximum staffing level during construction, staffing during normal operation, and staffing during refueling outages (from the ER)
- plant performance, including average annual capacity factors (from the ER)
- anticipated staffing levels during refurbishment (from the ER)
- anticipated staffing levels during the renewal term (from the ER)
- planned changes to the plant operating cycle during the renewal term, if any (from the ER)

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework for evaluation of the impacts of refurbishment and operation during the renewal term on the environment.

Regulatory positions and specific criteria necessary to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides a general discussion of nuclear-power-plant operation and maintenance.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for describing plant operation and maintenance is discussed in the following paragraph:

This section is descriptive in nature and presents information necessary for the evaluation of environmental impacts associated with plant operation and maintenance. The descriptions should be in sufficient detail to form an adequate basis for staff analysis of environmental impacts of refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The material to be prepared on plant operation and maintenance is informational in nature. No specific analysis is required. The following review steps are suggested:

- (1) Review the discussion of plant operation and maintenance in Section 2.2.6 of NUREG-1437.
- (2) Obtain a description of the plant operational history, including refueling cycle and annual average capacity.
- (3) Obtain information on the plant staffing history.
- (4) Obtain planned staffing during refurbishment, if any.
- (4) Obtain information on changes to staffing and operations during the renewal term, if any.
- (5) Prepare a section describing the plant operation and maintenance for the SEIS.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will depend on site-specific factors. The level of detail of information included in the SEIS should be scaled according to the anticipated magnitudes of the expected impacts. The reviewer should verify that the plant operation and maintenance description is consistent, accurate, and given in sufficient detail to serve the needs of the reviewers for ESRP/S1s in Chapters 3 and 4.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.53, "Postconstruction environmental reports."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.1.7 POWER TRANSMISSION SYSTEM

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the power transmission system constructed to service the applicant's plant.

The scope of the review includes a description of the components, location, and characteristics of the transmission system.

The description of the transmission system should include those transmission lines that were constructed for the specific purpose of connecting the plant to the transmission system. Review of these lines is required by 10 CFR 51.53(c)(3)(ii)(H) for the Category 2 issue related to electric shock. The scope of the review of the transmission lines for the Category 2 issue concerning threatened or endangered species should be identical to the scope of review for the Category 2 issue for electric shock.

Review Interfaces

The reviewer for this ESRP should provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1s 2.2.1, 2.2.6, and 2.2.8. Provide a description of the location of the power transmission lines constructed to connect the plant to the power grid.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS section prepared under ESRP/S1 2.1.7.
- ESRP/S1s 4.2.1, 4.2.2, 4.4.3, 4.4.5, 4.4.6, and 4.6.1. Provide a description of the power transmission system location and characteristics.

Data and Information Needs

The reviewer for this ESRP should obtain a description of the power transmission system (from the environmental report [ER] and previous EISs). The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework for evaluation of the impacts of refurbishment and operation during the renewal term on the environment.

Regulatory positions and specific criteria necessary to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides a general discussion of power transmission systems.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for describing plant operation and maintenance is discussed in the following paragraph:

This section is descriptive in nature and presents information necessary for the evaluation of environmental impacts associated with the power transmission system. The descriptions should be in sufficient detail to form an adequate basis for staff analysis of environmental impacts of refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The material to be prepared on the power-transmission system is informational in nature. No specific analysis is required. The following review steps are suggested:

- (1) Review the discussion of power transmission systems in Section 2.2.7 of NUREG-1437.
- (2) Obtain a description of the power transmission system constructed to connect the plant to the grid.
- (3) Prepare a section describing the power-transmission system for the SEIS.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will depend on site-specific factors. The level of detail of information included in the SEIS should be scaled according to the anticipated magnitudes of the expected impacts. The reviewer should verify that the power transmission system description is consistent, accurate, and given in sufficient detail to serve the needs of the reviewers for ESRP/SIs in Chapters 4.0.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.53, "Postconstruction environmental reports."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.2 PLANT INTERACTION WITH THE ENVIRONMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section introducing sections prepared by the staff that describe the plant's environment based on the reviews conducted under supplemental ESRPs (ESRP/S1s) 2.2.1 through 2.2.8.

The scope of the review directed by this plan includes (1) review of the general discussion of a nuclear plant's interactions with the environment in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), (2) review of the SEIS sections prepared by reviewers for ESRP/S1s 2.2.1 through 2.2.8, and (3) preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 2.0. Provide a list of the features related to the environment that warrant highlighting early in SEIS Chapter 2.0.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1s 2.2.1 through 2.2.8. Obtain lists of features related to the environment that warrant highlighting early in SEIS Chapter 2.0.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP should obtain an outline of the SEIS organization from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses at the license renewal stage
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of the draft EIS at the license-renewal stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the license renewal stage
- 10 CFR 51, Subpart A, Appendix B, with respect to the Commission's findings on the scope and magnitude of environmental impacts of renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant-specific analyses are required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential environmental impacts of refurbishment is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required.

The paragraph(s) should list the types of information to be presented and describe their relationships to information to be presented later in the SEIS. They should indicate that the objectives of SEIS subsections 2.2.1 through 2.2.8 are to provide a general description of the environment as background information and detailed descriptions where needed to support analyses of potential environmental impacts of refurbishment and operation during the renewal term that are presented later in the SEIS.

It may be appropriate to direct the reader's attention to specific subsections of the SEIS that provide information related to environmental issues that have been raised by the public in scoping meetings or in correspondence on the license-renewal application.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/S1s 2.2.1 through 2.2.8. The depth and extent of the input to the SEIS will be governed, in part, by the extent of the potential impacts of refurbishment and operation during the renewal term.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 51 Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.2.1 LAND USE

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of land use of the site and vicinity,^(a) region,^(b) and the transmission corridor connecting the plant to the electric transmission grid.

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- (a) For the purpose of these environmental reviews, "site" and "vicinity" are defined as follows:
1. "Site"—The site is defined as that area of land owned or controlled by the applicant for the principal purpose of operating a nuclear power station. As a general rule, the applicant's "site boundary" should be accepted as defining the site.
 2. "Vicinity"—For small sites (on the order of 2 km²), the vicinity is the area encompassed within a radius of 10 km (6 mi). For larger irregularly shaped sites, the vicinity is a band or belt 10-km (6-mi) wide surrounding the plant site. The intent is to investigate land use in an area in which the site makes up no more than 10% of the area. If a lake or pond is used by the station, the entire water body area should be included in the vicinity. The vicinity considered may follow natural or political boundaries.
- (b) For the purpose of these environmental reviews, the "region" is defined as an area within an 80-km (50-mi) radius of the station site, but excluding the "site and vicinity."

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2.2.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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The scope of the review directed by this plan should include the establishment of the nature and extent of present and planned land use within these areas that might be impacted or modified as a result of station refurbishment and operation during the license renewal (LR) term.

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2.2.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1 2.2.8. Provide land-use data to describe offsite socioeconomic factors.
- ESRP/S1 3.1. Provide land-use data as needed to describe onsite land uses.
- ESRP/S1s 3.6 and 4.4. Provide land-use data as needed to describe community characteristics.
- ESRP/S1s 3.6.6 and 4.4.5. Provide land-use data as needed to describe historic and archeological sites and natural landmarks.
- ESRP/S1 4.2. Provide land-use data as needed to support the land-use impact assessments for transmission lines during the LR term.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The degree of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- land-use data and descriptions from prior environmental documents, including the environmental impact statements (EISs) prepared at the construction permit and operating license stages
- maps showing land use within the site vicinity and region. (These maps should be of the same scale as maps showing the plant and construction areas in ESRP Chapters 3.0 and 4.0 of NUREG-1555 [NRC 1999b].) Land-use categories should be classified consistently with the U.S. Geological Survey (USGS) land-use classification codes listed in “USGS Land Use and Land Cover Data” (USGS 1997). Maps should show general patterns of ownership by outlining boundaries of parcels owned by individuals, or corporations, governments, or other entities (from the environmental report [ER], consultations with resource agencies, and USGS [1997]).
- land-use plans that include the site and vicinity within their scope (from applicable Federal, State, regional, local, and affected Native American tribal planning agencies)
- land areas (hectares) within the site boundary (from the ER)
- maps showing major land uses in the site vicinity with land uses classified consistently with the USGS categories (USGS 1997) (from the ER)

- land areas (hectares) that are devoted to major uses within the site vicinity (from the ER)
- maps showing highways, railroad lines, and transmission line routes connecting the plant to the electric power grid (from the FES and ER). The transmission line routes that were considered in the FES should be shown.
- the length, width, and area of the transmission line corridor that connects the plant to the electric transmission grid (from the FES and ER). The transmission line corridors should be those that were considered in the FES.
- land use within the transmission line corridor using the categories defined by the USGS (USGS 1997)
- special land-use classifications affecting the site, vicinity, and transmission line corridor that could be significantly affected by refurbishment of the plant or operation during the LR term (e.g., Indian or military reservations, wild and scenic rivers, State and national parks, national forests, designated coastal zone areas, floodplains, wildlife refuges, and wilderness areas) (from the ER, consultation with Federal, State, regional, local, and Native American tribal agencies, and USGS [1997]).

Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), Chapter 2.0 (NRC 1999a), identifies the land-use information for inclusion in an applicant's ER for LR.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of land use at the site, the vicinity of the site, and the transmission-line corridor are based on the relevant requirements of the following regulations:

- 10 CFR 51.71(d) with respect to analysis requirements to be included in EISs prepared by NRC and with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations
- 10 CFR 51, Appendix A(7), with respect to the discussion in EISs prepared by NRC of possible conflicts between alternatives and the objectives of applicable land-use plans
- 10 CFR 51.70(b) with respect to an independent evaluation and responsibility for the reliability of information used in the draft EIS
- 10 CFR 51.95(c)(4), with respect to the integration of information in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), information on Category 2 issues, and significant new information.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1 (NRC 1999a) provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of land use is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information. The review conducted under this ESRP leads to preparation of a section of the SEIS that provides background information to be used in evaluating land-use impacts of refurbishment activities and transmission line operation during the LR term.

III. REVIEW PROCEDURES

The reviewer's analysis of land-use characteristics should be closely linked with the impact assessment review described in ESRP Chapters 3.1 and 4.2 to establish the land-use characteristics most likely to be affected by LR. With this in mind, the reviewer should take the following steps:

- (1) Review the discussion of potential land-use impacts of refurbishment activities in Section 3.2 of NUREG-1437 to identify the information considered and the conclusions reached. Review the discussion in section 4.5.3 of NUREG-1437 of potential land-use impacts during the LR term of operation of the transmission lines connecting the plant to the electricity grid. These reviews establish the basis for evaluation of information identified by the applicant, the public, and the staff.
- (2) Identify the present land use within the site boundary, vicinity, and transmission corridor according to categories defined by the USGS (1997):
 - Base the level of detail in selecting land-use categories on the needs of subsequent assessments.
 - Identify total area by land-use category.

- Compare the land uses of the site, vicinity, and transmission corridor to be changed as a result of station refurbishment and operation during the LR term with existing land use.

(3) Identify land-use plans that include the site and vicinity within their scope.

IV. EVALUATION FINDINGS

The reviewer should ensure that the land-use information is adequate as a basis for assessment of the effects of refurbishment and operation of the station during the LR term. The reviewer should consult with appropriate Federal, State, regional, local, and affected Native American tribal agencies to assess the accuracy of the land-use designations.

The depth and extent of the input to the supplemental environmental impact statement (SEIS) will be governed by the land-use characteristics of the site and vicinity and the potential land-use impacts of plant refurbishment and operation during the LR term. The information should be presented in a concise form. Data should be given in tables showing the land use of the site, vicinity, and transmission-line corridor.

The following information should be included:

- a brief description of the land-use characteristics of the site, vicinity, and transmission corridor
- a tabulation of areas dedicated to each land-use category in the site, vicinity, and transmission corridor. The tabulations may be supplemented by land-use maps, as necessary, for clarity.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Appendix A, "Format for Presentation of Material in Environmental Impact Statements."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Geological Survey (USGS). 1997. “USGS Land Use and Land Cover Data,” USGS Earth Resources Observation Systems Data Center, Sioux Falls, South Dakota.



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2.2.2 WATER USE

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's description of surface-water and groundwater uses that could affect or be affected by refurbishment or operation during the renewal term.

The scope of the review directed by this plan includes (1) consideration of such water uses as domestic, municipal, agricultural, industrial, mining, recreation, navigation, and hydroelectric power, (2) identification of their locations, (3) quantification of water diversions, consumption, and returns, and (4) preparation of a section describing water use for the supplemental environmental impact statement (SEIS). The review should be limited to present and known future water uses. Where possible, the description may be based on previous environmental documents for the plant updated, as appropriate, with more recent data.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.1.1. Obtain a description of the plant location and setting.
- ESRP/S1 2.1.3. Obtain a description of the plant cooling and auxiliary water system.

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2.2.2-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1 3.4. Provide data as needed to describe plant uses.
- ESRP/S1 4.1.1. Provide water-use data as needed to evaluate potential water-use conflicts related to the cooling system operation during the renewal term.
- ESRP/S1s 4.5 and 4.5.1 through 4.5.3. Provide water-use data as needed to evaluate potential groundwater use conflicts resulting from operation during the renewal term.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- maps (including digital databases such as a Geographic Information System [GIS]) showing the relationship of the site to the major hydrological systems (from the environmental report [ER] or previous EISs and the general literature)
- maps showing the relationship of the site to surface-water bodies that could affect or be affected by plant water use (from the ER or previous environmental impact statements [EISs] and the general literature)
- maps (and cross sections where feasible) showing those portions of groundwater aquifer systems that could be affected by plant withdrawals and/or discharges (from the ER and the general literature)
- quantitative descriptions of present and known future groundwater withdrawals on the site. Aquifers at distances close enough to affect or be adversely affected by the plant should also be included. The following should be included for each withdrawal or discharge:
 - location and depth of well with respect to the site (from the ER or previous EISs, the site visit, peer-reviewed technical literature, and consultation with State and local agencies)
 - identification of aquifers (from the ER or previous EISs, peer-reviewed technical literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
 - the average monthly withdrawal rates by use category (from the ER or previous EISs, the site visit, the general literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
 - identification of any aquifers designated by EPA as sole source aquifers.

- quantitative descriptions of present and known future surface-water uses (withdrawals, consumptions, and returns) that are within the hydrological system in which the site is located and

that may affect or be affected by the plant. This should include a quantitative description of any water uses that provide potential liquid pathways for both radiological and nonradiological effluents. The following should be included for each withdrawal or discharge:

- locations of diversions and returns with respect to the site and the water body (from the site visit, the general literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
 - identification of the water body (from the ER or previous EISs and the general literature)
 - the average monthly withdrawal and return rate for each diversion by use category.
- quantitative and qualitative description of recreational, navigational, instream, and other nonconsumptive present and known future water uses. For a 10-km (6-mi) radius, this should include the following (from the ER or previous EISs, site visit, peer-reviewed technical literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies):
 - identification of water bodies and locations with respect to the site (maps may be useful)
 - the kind and location of activity on the water body (maps may be useful)
 - the use rate with time variation.
 - summary of statutory and other legal restrictions relating to water use or specific water-body restrictions on water use imposed by Federal or State regulations (from the ER or previous EISs and consultation with Federal, State, regional, local, and affected Native American tribal agencies).
 - a water-use diagram for the plant (Rosaler 1994) showing flow rates to and from the various water systems (e.g., circulating water system, sanitary system, radwaste and chemical waste systems, service water systems), points of consumption, and source and discharge locations (from the ER)
 - for the water-use diagram, the data and narrative description for maximum water consumption, water consumption during periods of minimum water availability, and average operation by month and by plant operating status (from the ER)
 - a description of other station water uses (i.e., all facilities not associated with the proposed plant) showing flow rates to and from the facility, average water consumption, and maximum water consumption (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of water use are based on the relevant requirements of the following regulations:

- 10 CFR 51.71(d) with respect to analysis requirements to be included in EISs prepared by NRC and with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations
- 10 CFR 51, Appendix A, with respect to discussion in EISs prepared by NRC of possible conflicts between alternatives and the objectives of applicable land-use plans.
- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS.
- 10 CFR 51.95(c)(4), with respect to integration of information in NUREG-1437, information on Category 2 issues, and significant new information.
- 33 CFR 322 with respect to definition of activities requiring permits
- 33 CFR 330, Appendix A, with respect to conditions, limitations, and restrictions on construction activities
- 40 CFR 6, Appendix A, with respect to procedures on floodplain and wetlands protection
- 40 CFR 122 with respect to National Pollutant Discharge Elimination System (NPDES) permit conditions for discharges, including storm water discharges
- 40 CFR 149 with respect to possible supplemental restrictions on waste disposal and water use in or above a sole source aquifer
- Federal, State, regional local, and Native American tribal water laws and water rights.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- Compliance with environmental quality standards and requirements of the Federal Water Pollution Control Act (FWPCA), commonly referred to as the Clean Water Act, is not a substitute for and does not negate the requirement for NRC to weigh the environmental impacts of the proposed action, including any degradation of water quality, and to consider alternatives to the proposed action that are available for reducing the adverse impacts. If an environmental assessment of aquatic impacts is available from the permitting authority, the NRC will consider the assessment in its determination of the magnitude of the environmental impacts in striking an overall benefit-cost balance. When no such assessment of aquatic impacts is available from the permitting authority, the NRC (possibly in conjunction with the permitting authority and other agencies having relevant expertise) should establish its own impact determination.

- Because water quality and water supply are interdependent, changes in water quality must be considered simultaneously with changes in water supply. In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the United States Supreme Court granted the States additional authority to limit hydrological alterations beyond the State's role in regulating water rights.
- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of environmental reports associated with LR.

Technical Rationale

The technical rationale for evaluating the impacts of water use are discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information. The review conducted under this ESRP leads to preparation of a section of the SEIS that provides background information to be used in evaluating water-use impacts of refurbishment activities and operation during the LR term.

III. REVIEW PROCEDURES

The reviewer's analysis of surface-water and groundwater use should consider the aspects of water use that are concerned with consumptive use, nonconsumptive use, and effluent pathways. The depth of analysis will be related to the importance of water use and proximity of the use to the plant. Emphasis should be given to those plant water uses that are expected to change during refurbishment or the renewal term. With this in mind, the reviewers should

- (1) Identify consumptive water uses that could affect the water supply of the plant or that may be adversely affected by the plant, including the following important characteristics:

- water source
 - locations of diversions and returns
 - amount and time variation of use
 - water rights.
- (2) Identify recreational, navigational, and other nonconsumptive water uses. The important characteristics to be quantified are
- location
 - activity
 - amount and time variation of use.
- (3) Identify the water uses that provide potential pathways for both radiological and nonradiological effluents, including the following important characteristics:
- water sources
 - location of diversions for consumptive uses
 - location of receptors for nonconsumptive uses
 - amount and time variation of use for each.
- (4) In addition to information obtained from the applicant's ER and from responses to subsequent questions to the applicant, use additional sources of data, such as
- local water-supply companies or agencies
 - river basin commissions
 - State agencies (e.g., water resources, fish and wildlife)
 - various Federal agencies, such as the Corps of Engineers and the U.S. Geological Survey, and Native American tribal agencies when needed to complete the analysis. Local water users may be questioned during the site visit.
- (5) Using the above information, compile and tabulate water uses by the categories and characteristics described in this ESRP section, but limit the analysis to consideration of present and known future water uses.
- (6) Ensure that water-use data and information are adequate to serve as a basis for assessing the impacts of refurbishment and operation during the renewal term on consumptive and nonconsumptive water uses.
- (a) In evaluating the adequacy of this material, the reviewer should ensure that data are
- sufficient to provide quantitative information on water-use characteristics to be impacted by refurbishment and operation during the renewal term

- are adequate to predict water-use impacts to the plant from refurbishment and operation during the renewal term.

(b) Consult with appropriate Federal, State, regional, local, and affected Native American tribal agencies in making this evaluation.

IV. EVALUATION FINDINGS

The reviewer should ensure that the water-use information is adequate as a basis for assessment of the effects of refurbishment and operation of the plant during the LR term. The depth and extent of the input to the supplemental EIS (SEIS) will be governed by the water-use characteristics of the site and vicinity and the potential water-use impacts of plant refurbishment and operation during the license-renewal term. The information should be presented in a concise form. Data should be given in tables where appropriate.

The following information should be included:

- a summary of present and known future groundwater withdrawals on the site and for distances great enough to cover potentially affected groundwater aquifers.
- a summary of present and known future surface-water uses that are within the hydrological system in which the plant is located and that may affect or be adversely affected by the plant.
- a summary of present and known future recreational, navigational, and other nonconsumptive water uses (maps may be useful).
- references to applicable Federal, State, regional, local, and affected Native American tribal water use laws.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Appendix A, "Format for Presentation of Material in Environmental Impact Statements."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Supplement to final environmental impact statement.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

33 CFR 322, “Permits for Structures and Work in or Affecting Navigable Waters of the United States.”

33 CFR 330, Appendix A, “Nationwide Permit and Conditions.”

40 CFR 6, Appendix A, “Statement of Procedures of Floodplain Management and Wetlands Protection.”

40 CFR 122, “EPA Administered Permit Programs: The NPDES Pollution Elimination System.”

40 CFR 149, “Sole Source Aquifers.”

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).

Rosaler, R. (ed). 1994. Standard Handbook of Plant Engineering. Second Edition, McGraw-Hill, New York.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission. 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission. 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION ENVIRONMENTAL STANDARD

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2.2.3 WATER QUALITY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's description of water-quality characteristics of surface-water bodies and groundwater aquifers that could affect or be affected by refurbishment or operation during the renewal term.

The scope of the review directed by this plan should include (1) consideration of site-specific and regional data on the physical, chemical, and biological water-quality characteristics of ground and surface water in sufficient detail to provide the basic data for other reviews dealing with the evaluation of water-quality impacts to water bodies, aquifers, aquatic ecosystems, and water use related to refurbishment and operation during the renewal term and (2) preparation of a section describing water use for the supplemental environmental impact statement (SEIS). Where possible, the description may be based on previous environmental documents for the plant updated, as appropriate, with more recent data.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.1. Obtain a description of the plant location and setting.

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2.2.3-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.3. Obtain a description of the plant cooling and auxiliary water system.
- ESRP/S1 2.2.2. Obtain a description of the plant's water system.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1 3.3. Provide data as needed to evaluate the impacts of refurbishment on water quality.
- ESRP/S1 3.4. Provide data as needed to describe water quality and expected changes in water quality for use in evaluating the impacts of refurbishment on aquatic resources.
- ESRP/S1s 4.5 and 4.5.4. Provide water-quality data as needed to evaluate potential groundwater quality degradation resulting from operation during the renewal term.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- the mean, range, and temporal and spatial variations of the surface water and groundwater quality characteristics
 - For surface waters: water temperature, suspended solids, total dissolved solids, hardness, turbidity, color, odor, conductivity, dissolved oxygen, biological oxygen demand (BOD), chemical oxygen demand (COD), phosphorus forms (total and orthophosphate), nitrogen forms (ammonia, nitrate, nitrite, organic), alkalinity, chlorides, sulfate, sodium, potassium, calcium, magnesium, heavy metals (e.g., Hg, Pb), pH, phytoplankton (chlorophyll *a*), and indicator microorganisms (e.g., total coliform, fecal coliforms, fecal streptococci). This information should be obtained from the environmental report (ER), previous EISs, and from consultation with Federal, State, regional, local, and affected Native American tribal agencies.
 - For groundwaters: the above surface-water data, minus phytoplankton and with silica, iron, carbon dioxide, and bicarbonate added (from the ER, previous EISs, and from consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- other site-specific water-quality characteristics (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- descriptions, such as 303(d) lists (classifications of the quality of each of the State's water bodies—required under the Federal Water Pollution Control Act [FWPCA], commonly referred to as the Clean Water Act [CWA]) of pre-existing aquatic environmental stresses and their effects on surface or groundwater quality for waters that interact with the plant (e.g., water bodies at or near the site

that do not meet established water-quality standards) (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)

- descriptions of pollutant sources with discharges to water that may interact with the plant, including locations relative to the site and the affected water bodies, and the magnitude and nature of the pollutant discharges, including spatial and temporal variations (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies).
- comparison of standard practices relative to plants waste water treatment system (AWWA 1990)
- State 303d lists of impaired waters.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of water use are based on the relevant requirements of the following regulations:

- 10 CFR 51.71(d) with respect to analysis requirements to be included in EISs prepared by NRC and with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations
- 10 CFR 51, Appendix A, with respect to discussion in EISs prepared by NRC of possible conflicts between alternatives and the objectives of applicable land-use plans.
- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS.
- 10 CFR 51.95(c)(4), with respect to integration of information in NUREG-1437, information on Category 2 issues, and significant new information.
- 33 CFR 322 with respect to definition of activities requiring permits
- 33 CFR 330, Appendix A, with respect to conditions, limitations, and restrictions on construction activities
- 40 CFR 6, Appendix A, with respect to procedures on floodplain and wetlands protection
- 40 CFR 122-133 with respect to National Pollutant Discharge Elimination System (NPDES) permit conditions for discharges, including storm-water discharges
- 40 CFR 147 with respect to restrictions on waste disposal options

- 40 CFR 149 with respect to possible supplemental restrictions on waste disposal and water use in or above a sole source aquifer
- 40 CFR 165 with respect to the disposal and storage of pesticides and pesticide containers
- 40 CFR 227 with respect to criteria for evaluating environmental impacts
- 40 CFR 403 with respect to waste effluents
- 40 CFR 423 with respect to effluent limitations on existing and new point sources
- 40 CFR 700 - 716 with respect to practices and procedures for managing toxic chemicals
- Federal, State, regional, local, and affected Native American tribal water laws and water rights.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- Compliance with environmental quality standards and requirements of the CWA is not a substitute for and does not negate the requirement for NRC to weigh the environmental impacts of the proposed action, including any degradation of water quality, and to consider alternatives to the proposed action that are available for reducing the adverse impacts. If an environmental assessment of aquatic impacts is available from the permitting authority, the NRC should consider the assessment in its determination of the magnitude of the environmental impacts in striking an overall benefit-cost balance. When no such assessment of aquatic impacts is available from the permitting authority, the NRC (to the degree possible in conjunction with the permitting authority and other agencies having relevant expertise) should establish its own impact determination.
- Because water quality and water supply are interdependent, changes in water quality must be considered simultaneously with changes in water supply. In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the U.S. Supreme Court granted the States additional authority to limit hydrological alterations beyond the State's role in regulating water rights.
- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing environmental reports associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of environmental reports associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of water-quality characteristics, surface-water bodies, and groundwater aquifers is discussed in the following paragraph:

A detailed and thorough description of the water quality is essential for the evaluation of potential impacts to the environment that may result from plant refurbishment and operation during the renewal term. The review conducted under this ESRP provides background water-quality material that is essential for understanding the impacts on water use, water quality, land use, and ecological systems from refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The reviewer's analysis of water quality should be closely linked with the reviews described in the Review Interfaces section of this ESRP to ensure that the physical, chemical, and biological water-quality parameters that could affect or be affected by plant refurbishment and operation during the renewal term have been described. With this in mind, the reviewer should take the following steps:

- (1) Identify the location and spatial distribution of the physical, chemical, and biological characteristics, the monthly and annual ranges, and the historical extremes of those water-quality characteristics that could potentially affect or be affected by plant refurbishment and operation during the renewal term.
 - Adjust the data for present day conditions.
 - If historical observations are incomplete or unavailable for the locations of concern, obtain these data through consultation with the applicant or with appropriate resource agencies.
- (2) Determine the presence of existing water-quality-related environmental stresses.
 - Determine stresses on the bases of the quality criteria requirements of other water users, as indicated by the approved water-use classification (such as 303(d), lists) or water resource planning documents for the water body in question.
 - As part of the determination, consult the historical literature addressing water-quality issues for the water body in question.
- (3) When applicable, discuss the water-quality conditions, water rights, and agreements as they affect water quality and water resource plans for the site and vicinity with Federal, State, regional, local, and affected Native American tribal water resource and pollution control and monitoring agencies.

- (4) Obtain the information primarily from the applicant's ER, responses to questions to the applicant, and consultation with Federal, State, regional, local, and affected Native American tribal agencies.

Use sources of data such as river basin planning organizations and State and Federal agencies, such as the EPA, the U.S. Army Corps of Engineers, and the U.S. Geological Survey, if additional information or verification is deemed necessary.^(a)

- (5) Ensure that the

- data are sufficient to provide quantitative information on the physical, chemical, and biological water-quality characteristics potentially affecting or affected by plant refurbishment and operation during the renewal term
- water-quality descriptions are sufficient, with respect to relevancy, completeness, reliability, and accuracy for input to the impact assessments of other sections
- Federal, State, regional, local, and affected Native American tribal agencies appropriate to the objectives of this review have been consulted.

- (6) When evaluating the adequacy of this material,

- Consult the applicable standards and guides for this environmental review and use the site visit and/or consultations to permitting agencies to evaluate the completeness of the water-quality descriptions.
- Evaluate, when necessary, the collection of additional data, the verification of data, and the substantiation of the methodology used to estimate water-quality parameters.

- (7) Include the appropriate depth and extent of the input to the EIS as governed by the water-quality characteristics that could affect or be affected by plant refurbishment and operation and by the nature and magnitude of the expected impacts. The following information should be included as input to the EIS:

-
- (a) If site-specific data are unavailable, the following sources are recommended:
- a. comprehensive framework studies of water and related lands by river basin planning organizations and regional interagency committees
 - b. Storage and Retrieval System for Water and Biological Data (STORET) water-quality data, time period, and water-quality constituents from the EPA
 - c. reports and data from State agencies, including ecology, conservation, public health, fish and game, forestry, agriculture, water resources, State lands, State engineer, and highway departments and special natural resources commissions (names and functions vary from State to State), and from affected Native American tribal agencies.

- descriptions of site and vicinity surface-water and groundwater quality that could affect or be affected by plant refurbishment and operation. The description may consist of statistical summaries of the water-quality characteristics, including mean, mean low and high, and historical low and high values (as available) for the site and vicinity. The data included should be commensurate with the anticipated impacts. Figures may be used to show long-term and seasonal trends, such as variations in dissolved oxygen and nutrient concentrations and pH variations.
- a description of the water-quality related environmental stresses in the site and vicinity.

IV. EVALUATION FINDINGS

The depth and extent of the input to the supplemental EIS (SEIS) will be governed by the analyses required by the ESRP/S1s in Chapters 3 and 4. Information that may be included in the SEIS is described in Review Procedures.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Appendix A, "Format for Presentation of Material in Environmental Impact Statements."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

33 CFR 322, "Permits for Structures and Work in or Affecting Navigable Waters of the United States."

33 CFR 330, Appendix A, “Nationwide Permit and Conditions.”

40 CFR 6, Appendix A, “Statement of Procedures of Floodplain Management and Wetlands Protection.”

40 CFR 122-133, “Relevant Sections of NPDES Pollution Elimination System.”

40 CFR 147, “State Underground Injection Control Programs.”

40 CFR 149, “Sole Source Aquifers.”

40 CFR 165, “Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers.”

40 CFR 227, “Criteria for the Evaluation of Permit Applications for Ocean Dumping of Material.”

40 CFR 403, “General Pretreatment Regulations for Existing and New Sources of Pollution.”

40 CFR 423, “Steam Electric Power Generating Point Source Category.”

40 CFR 700-716, “Relevant Sections of Toxic Substances Control Act.”

American Water Works Association (AWWA). 1990. *Water Quality and Treatment*, 4th Edition, McGraw-Hill Book Company, New York.

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).



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2.2.4 AIR QUALITY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the meteorology and climatology of the site and surrounding area, characterization of atmospheric transport and diffusion, and description of air quality. This review should provide background information for inclusion in the supplemental environmental impact statement (SEIS) and input to reviewers for supplemental ESRPs (ESRP/S1s) for license renewal (LR) dealing with evaluation of the impacts of plant refurbishment and operation during the renewal term.

The scope of the review directed by this plan includes descriptions of (1) regional climatology, (2) meteorological characteristics of the site and vicinity using data from the onsite meteorological monitoring program, (3) local and regional atmospheric transport and diffusion characteristics, and (4) local and regional air quality.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 2.1. Obtain a description of the plant location.

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2.2.4-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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- ESRP/S1 2.1.3. Obtain descriptions of the cooling system and components related to heat dissipation in the atmosphere.

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2.2.4-1

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- ESRP/S1 2.1.4. Obtain descriptions of release points for radioactive effluents.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1s 3.2 and 3.2.1. Provide a description of the meteorology at the site of the proposed plant and meteorological data for air quality modeling.
- ESRP/S1s 3.7 and 4.3. Provide appropriate dispersion estimates for dose calculations, if necessary (see ESRP 2.7 for detailed description).
- ESRP/S1 4.1. Provide meteorological data as required to analyze and evaluate heat-dissipation system effects on the atmosphere, if necessary.
- ESRP/S1 5.1. Provide appropriate dispersion estimates for dose calculations, if necessary (see ESRP 2.7 for detailed description).

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- climatic descriptions from prior environmental documents, including the environmental impact statements (EISs) prepared at the construction-permit and operating-license stages
- recent climatological data from nearby National Weather Service (NWS) stations
- hourly and summarized meteorological data from the onsite meteorological program for the most recent 5-year period
- descriptions of meteorological phenomena, if any, associated with the plant's cooling system operation (from the environmental report [ER])
- a description of regional air quality, including the locations of mandatory Federal Class I areas and non-attainment or maintenance areas in the region (from the ER)
- topographic data if substantially different from the data presented in earlier EISs (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of site meteorology and air quality are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of ERs and required analyses
- 10 CFR 51.70(b) with respect to permitting an independent evaluation of the reliability of the meteorological and climatological information
- 10 CFR 51.71(d) with respect to giving consideration to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the LR stage
- 40 CFR 50 with respect to definition of criteria pollutants and National Ambient Air Quality Standards
- 40 CFR 51, Subpart W, with respect to requirements related to determination that the proposed Federal action conforms to applicable implementation plans
- 40 CFR 51, Appendix W, with respect to air quality models
- 40 CFR 81, Subparts C and D, with respect to attainment status designations approved by the EPA and identification of mandatory Class I Federal areas.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant specific analyses are required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 1.23, *Onsite Meteorological Programs* (NRC 1972), and ESRP 2.7 in NUREG-1555 (NRC 1999b) provide guidance on onsite meteorological measurements for use in licensing applications.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of the meteorology, climatology, and air quality of the site is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of a section of the SEIS that provides background information used in evaluating impacts of refurbishment activities and operation during the renewal term on the air quality. The information may also be used in assessing doses associated with refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The review of meteorology, climatology, and air quality should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment activities on air quality in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain descriptions of the site meteorological, climatological, and dispersion characteristics from prior environmental documents.
- (3) Obtain recent meteorological data for the site and climatological data for the region surrounding the site.
- (4) Obtain the air-quality attainment status and available air-quality data for the region. The air-quality attainment status is one of the factors used to determine the extent of analysis required by 10 CFR 51.53(c)(3)(iii)(F).
- (5) Update the descriptions of meteorology, climatology, and air quality presented in prior environmental documents using recent data.
- (6) Obtain an estimate from the reviewer of ESRP/S1 3.2.1 of the extent of the analysis required to evaluate potential impacts on air quality from the emissions of vehicles of the refurbishment work force.
- (7) Determine if the reviewers for ESRP/S1s 3.7, 4.3, and 5.1 will require updated atmospheric dispersion estimates for dose calculations.

- (8) Determine if the reviewers for ESRP/S1s 4.1 and 4.2 are aware of significant new information that would require specialized atmospheric modeling.

If the atmospheric dispersion calculations will be required to determine the potential impact of refurbishment workers' vehicles on air quality in nonattainment or maintenance areas or for dose calculations, or if specialized atmospheric modeling will be required, then continue the review at Step (9). Otherwise, prepare a section for the SEIS that presents an updated summary of the meteorology and climatology for the plant site and region. The summary should touch upon normal conditions and recent severe weather.

- (9) Determine the specific atmospheric models to be used to support reviews being conducted under other ESRP/S1s and the data requirements of those models. Models to support dose calculations are described in Regulatory Guides 1.111, Rev. 1, *Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors* (NRC 1977), and 1.145, Rev. 1, *Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants* (1983) and models approved by the EPA for air-quality calculations are listed in Appendix W of 40 CFR 51.
- (10) Prepare the meteorological data for use by the atmospheric models and assist the reviewers of the other ESRP/S1s in making the appropriate model calculations.
- (11) Prepare a section for the SEIS that presents an updated summary of the meteorology and climatology for the plant site and region. The summary should touch upon normal conditions and recent severe weather. The section should describe and summarize the meteorological data used in atmospheric model calculations. The atmospheric models used should be identified in the SEIS, but detailed model descriptions should be avoided.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required. The information that should be included in the SEIS is described in the review procedures.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR 50, “Primary and Secondary Ambient Air Quality Standards.”

40 CFR 51, Subpart W, “Determining Conformity of General Federal Actions to State or Federal Implementation Plans.”

40 CFR 51, Appendix W, “Guidelines on Air Quality Models.”

40 CFR 81, Subpart C, “Section 107 Attainment Status Designations.”

40 CFR 81, Subpart D, “Identification of Mandatory Class I Federal Areas Where Visibility is an Important Value.”

U.S. Nuclear Regulatory Commission (NRC). 1972. Regulatory Guide 1.23. *Onsite Meteorological Programs*.

U.S. Nuclear Regulatory Commission (NRC). 1977. Regulatory Guide 1.111, Rev. 1. *Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors*.

U.S. Nuclear Regulatory Commission (NRC). 1983. Regulatory Guide 1.145, Rev 1. *Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants*.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1.
*Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant
Operating Licenses.* Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION ENVIRONMENTAL STANDARD

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2.2.5 AQUATIC RESOURCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's description of the aquatic environment and biota at and in the vicinity of the site and other areas likely to be impacted by the plant refurbishment or operation during the renewal term. This review should provide input to reviews dealing with evaluation of impacts on aquatic ecosystems of refurbishment and operation during the renewal term and to other reviews that deal with the aquatic environment.

The scope of the review directed by this plan includes (1) a description of the spatial and temporal distribution, abundance, and other structural and functional attributes of biotic assemblages, (2) identification of any "important" or irreplaceable aquatic natural resources and the location of sanctuaries and preserves, and (3) preparation of a section describing aquatic resources for the supplemental environmental impact statement (SEIS). Where possible, the description may be based on previous environmental documents for the plant updated, as appropriate, with more recent data.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.1. Obtain a description of the plant location and setting.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.3. Obtain a description of the plant cooling and auxiliary water system.
- ESRP/S1 2.1.7. Obtain a description of the transmission system.
- ESRP/S1 2.2.2. Obtain a description of the plant water use.
- ESRP/S1 2.2.3. Obtain a description of the water quality of the site and vicinity.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1s 3.4 and 3.8.1. Provide data, as needed, to evaluate the impacts of plant refurbishment on aquatic resources.
- ESRP/S1s 4.1.2, 4.1.3, and 4.6.1. Provide data, as needed, to evaluate the environmental impacts of operation during the renewal term on aquatic resources.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- characterization of the aquatic environment of the water body and onsite streams, including the following information categories:
 - biological (from the environmental report [ER], previous EISs, and the general literature)
 - hydrological (from ESRP/S1 2.2.2)
 - physiochemical (from ESRP/S1 2.2.3).
- maps showing “important” aquatic resources of the site and vicinity (see Table 2.2.5-1)
- the temporal and spatial (including depth) distribution and abundance of “important” aquatic species, especially in the discharge area and receiving water body. Describe and map (where appropriate) critical life-support requirements as spawning areas, nursery grounds, food habits, feeding areas, wintering areas and migration routes (to the extent that plant refurbishment and operation during the renewal term is expected to affect these parameters).
- the location and value of the commercial and sport fisheries and the seasonal distribution of harvest by species (from the ER, previous EISs, the general literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)

Table 2.2.5-1. Important Species and Habitats

| Species | Habitat |
|--|--|
| <p>Rare species</p> <ul style="list-style-type: none"> • Listed as threatened or endangered at 50 CFR 17.11 (Fish and wildlife) or 50 CFR 17.12 (Plants). This information may also be found via the Internet at the U.S. Fish and Wildlife website in the Geographical, Environmental and Siting Information System (GEn&SIS). • Proposed for listing as threatened or endangered, or is a candidate for listing in the most current list of such species as published in the <i>Federal Register</i>. This information may also be found via the Internet at the U.S. Fish and Wildlife website in GEn&SIS. • Listed as a threatened, endangered, or other species of concern by the State or States in which the proposed facilities are located <p>Commercially or recreationally valuable species</p> <p>Species that are essential to the maintenance and survival of species that are rare and commercially or recreationally valuable (as defined previously)</p> <p>Species that are critical to the structure and function of the local aquatic or terrestrial ecosystem</p> <p>Species that may serve as biological indicators to monitor the effects of the facilities on the aquatic environment</p> | <p>Wildlife sanctuaries, refuges, or preserves, if they may be adversely affected by plant or transmission line construction, operation, or refurbishment</p> <p>Habitats identified by Federal, State, regional, local and affected Native American tribal agencies as unique, rare, or of priority for protection, if these areas may be adversely affected by plant or transmission line operation and maintenance</p> <p>Wetlands (Executive Order 11990), floodplains (Executive Order 11988), or other resources specifically protected by Federal regulations or Executive Orders, or by State, regional, local, or affected Native American tribal regulations</p> <p>Land areas identified as “critical habitat” for species listed as threatened or endangered by the U.S. Fish and Wildlife Service</p> |

- endangered and threatened aquatic species that are known to be present or could potentially occur onsite and an identification of their other locations and critical habitats within the region. Also identify specific habitat requirements (e.g., thermal tolerance ranges), community interrelationships, and relative abundance (from the ER, previous EISs, the general literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies).

- key aquatic indicator organisms expected to gauge changes in the distribution and abundance of species populations that are particularly vulnerable to impacts from plant, refurbishment, and/or operation
- the presence of “nuisance” species such as *Corbicula* sp. or *Mytilus* sp. onsite or in the vicinity of the plant and that are capable of blocking or bio-fouling the cooling water intake system or that can cause other significant problems
- the relative significance of important aquatic habitats in a regional context (from the ER, previous EISs, the general literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies).
- a description of onsite natural, man-induced, and pre-existing environmental stresses, and the current ecological conditions that are indicative of such stresses (from the ER and previous EISs).

The reviewer for this ESRP should obtain the following data or information about transmission corridors and offsite areas when the transmission corridors and offsite areas intersect or are adjacent to aquatic resources:

- a map and description of the location and extent of threatened and endangered or other “important” aquatic species that are known or expected to be present in the vicinity of the transmission corridors together with any specific habitat requirements (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- any physical, chemical, and biological factors known to influence distribution and abundance of threatened and endangered aquatic life in the vicinity of the transmission corridors (from the general literature)
- documentation that the applicant has consulted with the appropriate Federal and/or State agencies regarding threatened or endangered species (e.g., as required by the Fish and Wildlife Coordination Act) (from the ER and previous EISs)

II. ACCEPTANCE CRITERIA

Acceptance criteria for the description of aquatic resources are based on the relevant requirements of the following regulations:

- 10 CFR 51.71(d) with respect to analysis requirements to be included in EISs prepared by NRC and with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations

- 10 CFR 51, Appendix A(7), with respect to discussion in EISs prepared by NRC of possible conflicts between alternatives and the objectives of applicable land-use plans
- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS
- 10 CFR 51.95(c)(4) with respect to integration of information in NUREG-1437, information on Category 2 issues, and significant new information
- Coastal Zone Management Act of 1972 with respect to natural resources, and land or water use of the coastal zone
- Endangered Species Act of 1973 with respect to identifying threatened and endangered species, critical habitats, and initiating formal or informal consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- Federal Water Pollution Control Act Amendments of 1972 with respect to restoration and maintenance of the chemical, physical, and biological integrity of water resources
- Fish and Wildlife Coordination Act of 1958 with respect to consideration of fish and wildlife resources in the planning of development projects that affect water resources
- Marine Mammal Protection Act of 1972 with respect to the protection of marine mammals
- Marine Protection, Research, and Sanctuaries Act of 1972 with respect to dumping of dredged material into the ocean
- Rivers and Harbors Appropriations Act of 1899 with respect to the deposition of debris in navigable waters, or tributaries to such waters.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.
- Regulatory Guide 4.7, *General Site Suitability for Nuclear Power Stations* (NRC 1998), contains guidance concerning the ecological systems and biota at sites and requires that their environs be sufficiently well known to allow reasonably certain predictions that there would be no unacceptable or unnecessary deleterious impacts on populations of important species or on ecological systems with which they are associated.

Technical Rationale

The technical rationale for describing the aquatic resources of the area is discussed in the following paragraph:

A detailed and thorough description of the aquatic ecology in the vicinity of the power station site and associated transmission corridors is essential for the evaluation of potential impacts to the aquatic environment that may result from plant refurbishment or operation during the renewal term. Use of the above acceptance criteria will help ensure inclusion of the aquatic ecological attributes most needed to predict impacts.

III. REVIEW PROCEDURES

The reviewer should ensure that the regional and site-specific aquatic ecological information is adequate to serve as a basis for assessment of the effects of plant refurbishment and operation during the renewal term. In assessing the adequacy of the description of aquatic resources of the onsite and offsite areas, the reviewer should consult the applicable acceptance criteria of this ESRP section and review the discussion of the impacts of plant refurbishment and operation during the renewal term on aquatic resources in NUREG-1437. Within the criteria and discussion in NUREG-1437, the reviewer may find those descriptive features of aquatic resources needed for the SEIS.

With these guidelines in mind, the reviewer should take the following steps:

- (1) Identify the species and habitats that will be considered “important” ecological resources of the site, vicinity, transmission corridors, and offsite areas for evaluation of potential impacts on them. Important aquatic resources are defined in Table 2.2.5-1.
- (2) Consult with local offices of the appropriate Federal, State, regional, local, and affected Native American tribal agencies to verify the possible occurrence of such species.
- (3) Identify the threatened and endangered species that, based on known distributions, could be present within these areas, but that have not been recorded by documented observations.

(4) In the case of commercially or recreationally valuable species, list those that could be adversely impacted by LR, and in addition to the applicant's ER, consult with State or local agencies or organizations that maintain records of harvest levels of these species.

(5) Review the available site-specific data for adequacy, accuracy, and completeness.

The input to the SEIS should include descriptions of the onsite and offsite areas potentially affected by LR. The input should be brief and should contain the following information:

- the principal aquatic ecological features of the site and vicinity and those sensitive offsite areas affected by transmission and access corridors and related facilities, with emphasis on the communities of the ecosystem that will be potentially affected by plant refurbishment and operation during the renewal term
- descriptions of existing environmental or man-induced stresses to aquatic biota at the site and vicinity
- a discussion of "important" aquatic species that may be affected by plant refurbishment and operation during the renewal term. Estimates of their abundance should be provided where appropriate. Special habitat and forage needs should be emphasized, if the proposed project would potentially disrupt these.
- a summary of consultations with appropriate Federal and/or State agencies.

IV. EVALUATION FINDINGS

The level of detail of the SEIS input will be governed by the kinds of aquatic ecological resources that could be affected by plant refurbishment and operation during the renewal period, by the nature and magnitude of the expected impacts to these resources, and by the analyses required for the ESRP/S1s in Chapters 3 and 4. Information that may be included in the SEIS is described in Review Procedures.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Appendix A, "Format for Presentation of Material in Environmental Impact Statements."

10 CFR 51.70, “Draft environmental impact statement–general.”

10 CFR 51.71, “Draft environmental impact statement–contents.”

10 CFR 51.95, “Supplement to final environmental impact statement.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

50 CFR 17.11, “Fish and wildlife.”

50 CFR 17.12, “Plants.”

Coastal Zone Management Act, as amended, 16 USC 1451 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Executive Order 11988, “Floodplain Management.”

Executive Order 11990, “Protection of Wetlands.”

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

Marine Mammal Protection Act of 1972, Pub. L. 92-522, Oct. 21, 1972, 86 Stat. 1027, as amended, 16 USC 1361 et seq.

Marine Protection, Research, and Sanctuaries Act, as amended, 33 USC 1401 et seq.

Rivers and Harbor Appropriations Act, as amended, 33 USC 401 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1988. Regulatory Guide 4.7, Revision 2. *General Site Suitability for Nuclear Power Stations*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1.
*Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant
Operating Licenses.* Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION ENVIRONMENTAL STANDARD

REVIEW PLAN OFFICE OF NUCLEAR REACTOR REGULATION

2.2.6 TERRESTRIAL RESOURCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's description of the terrestrial environment and biota at and in the vicinity of the site and other areas likely to be impacted by the plant refurbishment or operation during the renewal term. This review should provide input to reviews dealing with evaluation of impacts on terrestrial ecosystems of refurbishment and operation during the renewal term and to other reviews that deal with land use.

The scope of the review directed by this plan includes (1) a description of species composition, spatial and temporal distribution, abundance, and other structural and functional attributes of biotic assemblages that could be affected by license renewal (LR), (2) identification of any "important" or irreplaceable terrestrial natural resources and the location of wildlife sanctuaries and preserves, and (3) preparation of a section describing terrestrial resources for the supplemental environmental impact statement (SEIS). Where possible, the description may be based on previous environmental documents for the plant updated, as appropriate, with more recent data.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

October 1999

2.2.6-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.1. Obtain a description of the plant location and setting.
- ESRP/S1 2.1.7. Obtain a description of the transmission system.
- ESRP/S1 2.2.1. Obtain a description of the land use in the vicinity of plant and transmission lines.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1s 3.5, 3.5.1, and 3.8.1. Provide data as needed to evaluate the impacts of plant refurbishment on terrestrial resources.
- ESRP/S1 4.6.1. Provide data as needed to evaluate the environmental impacts of operation during the renewal term on terrestrial resources.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impacts of plant refurbishment and operation during the renewal term. The following information may be needed:

- a map that identifies “important” terrestrial habitats on and in the vicinity of the site and transmission corridors (see Table 2.2.6-1)
- a description and map of natural and man-made habitats within the site (from the environmental report [ER], and previous EISs)
- U.S. Geological Survey (USGS) topographic maps of the site (7½-min scale, when available) (from the general literature)
- list and description of “important” species (see Table 2.2.6-1) and their spatial and temporal distributions on and in the vicinity of the site, including (as appropriate) their relative abundance, critical habitat, and their life histories—critical life stages, biologically significant activities, seasonal habitat requirements and population fluctuations, food chain, and other interspecific relationships (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a qualitative estimate of the importance of habitat of threatened, endangered, and other “important” species on and in the vicinity of the site relative to the habitat of such species throughout their entire range (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)

- locations of travel corridors for “important” terrestrial species and alternate routes for those corridors that could potentially be blocked by refurbishment, as applicable (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a description of natural and man-induced effects (e.g., farming, logging, grazing, burning) and pre-existing environmental stresses (e.g., infestations, epidemics, catastrophes), and the current ecological conditions that are indicative of such stresses (from the ER and previous EISs)
- a description and location of any ecological or biological studies of the site or its environs that are recent or currently in progress (from the ER and previous EISs)
- documentation that the applicant has consulted with the appropriate Federal and State agencies (e.g., as required by the Fish and Wildlife Coordination Act) (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies).

The following data and information about transmission corridors and offsite areas may be obtained, if appropriate:

- a map that identifies “important” terrestrial species and habitats along routes of transmission and access corridors from the station site to interconnecting points on the high-voltage system
- major vegetation types within the corridors (from the ER, previous EISs, site visit, and through consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a list of threatened or endangered species (plants and animals) known to occur within the corridors and adjacent areas, their seasons of occurrence, estimates of abundance, local flight patterns, and critical habitats (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- where transmission lines cross important waterfowl areas, a list of descriptions of these areas and data on the local abundance and distribution of waterfowl, their seasonal status, and local flight patterns (from the ER, previous EISs, and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a summary of any pre-existing environmental stress from such sources such as pollutants, as well as pertinent ecological conditions suggestive of such stresses. A discussion of histories of any infestations, epidemics, or catastrophes (caused by natural phenomena) that have had a significant impact on biota in the vicinity of the transmission corridors should also be included.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the description of aquatic resources are based on the relevant requirements of the following regulations:

- 10 CFR 51, Appendix A(7), with respect to discussion in EISs prepared by NRC of possible conflicts between alternatives and the objectives of applicable land-use plans
- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS
- 10 CFR 51.71(d) with respect to analysis requirements to be included in environmental impact statements (EISs) prepared by NRC and with respect to compliance with environmental-quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations
- 10 CFR 51.95(c)(4) with respect to integration of information in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), information on Category 2 issues, and significant new information
- Bald and Golden Eagle Protection Act with respect to the prohibition of taking, possessing, selling, transporting, importing, or exporting the bald or golden eagle, dead or alive, without a permit
- Endangered Species Act of 1973 with respect to identifying threatened and endangered species, critical habitats, formal or informal consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- Fish and Wildlife Coordination Act of 1958 with respect to consideration of fish and wildlife resources in the planning of development projects that affect water resources
- Migratory Bird Treaty Act with respect to declaring that it is unlawful to take, import, export, possess, buy, sell, purchase, or barter any migratory bird. Feathers, or other parts of nests and eggs, and products made from migratory birds are also covered by the Act. "Take" is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping, or collecting.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR Parts 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b) provides guidance on preparation of ERs associated with LR.

- Regulatory Guide 4.7, Rev. 2, *General Site Suitability for Nuclear Power Stations* (NRC 1998), contains guidance concerning the ecological systems and biota at sites and requires that their environs be sufficiently well known to allow reasonably certain predictions that there would be no unacceptable or unnecessary deleterious impacts on populations of important species or on ecological systems with which they are associated.
- Regulatory Guide 4.11, Rev. 1, *Terrestrial environmental Studies for Nuclear Power Stations* (NRC 1977), contains technical information for the design and execution of terrestrial environmental studies, the results of which may be appropriate for inclusion in the applicant's ER. The reviewer should ensure that the appropriate results are included in the ER.

Technical Rationale

The technical rationale for describing the terrestrial resources of the area is discussed in the following paragraph:

A detailed and thorough description of the terrestrial ecology in the vicinity of plant and associated transmission corridors is essential for the evaluation of potential impacts to the terrestrial environment that may result from plant refurbishment or operation during the renewal term. Use of the above acceptance criteria will help ensure inclusion of the terrestrial ecological attributes most needed to predict impacts.

III. REVIEW PROCEDURES

The reviewer should ensure that the regional and site-specific terrestrial ecological information is adequate to serve as a basis for assessment of the effects of plant refurbishment and operation during the renewal term. In assessing the adequacy of the description of terrestrial resources of the site and offsite areas, the reviewer should consult the applicable acceptance criteria of this ESRP section and review the discussion of the impacts of plant refurbishment and operation during the renewal term on terrestrial resources in NUREG-1437. Within the criteria and discussion in NUREG-1437, the reviewer may find those descriptive features of terrestrial resources needed for the SEIS.

With these guidelines in mind, the reviewer should take the following steps:

- (1) Identify the species and habitats that will be considered "important" terrestrial ecological resources of the site, vicinity, transmission corridors, and offsite areas for evaluation of potential impacts on them. Important resources are defined in Table 2.2.6-1.
- (2) Consult with local offices of the appropriate Federal agencies and the appropriate State agencies to verify the possible occurrence of such species.
- (3) Identify the threatened and endangered species that, based on known distributions, could be present within these areas, but that have not been recorded by documented observations.

Table 2.2.6-1. Important Species and Habitats

| Species | Habitat |
|--|--|
| <p>Rare species</p> <ul style="list-style-type: none"> • Listed as threatened or endangered at 50 CFR 17.11 (Fish and wildlife) or 50 CFR 17.12 (Plants). This information may also be found via the Internet at the U.S. Fish and Wildlife website in the Geographical, Environmental, and Siting Information System (GEN&SIS). • Proposed for listing as threatened or endangered, or is a candidate for listing in the most current list of such species as published in the <i>Federal Register</i>. This information may also be found via the Internet at the U.S. Fish and Wildlife website in GEN&SIS. • Listed as a threatened, endangered, or other species of concern by the State or States in which the proposed facilities are located <p>Commercially or recreationally valuable species</p> <p>Species that are essential to the maintenance and survival of species that are rare and commercially or recreationally valuable (as defined previously)</p> <p>Species that are critical to the structure and function of the local terrestrial ecosystem</p> <p>Species that may serve as biological indicators to monitor the effects of the facilities on the terrestrial environment</p> | <p>Wildlife sanctuaries, refuges, or preserves, if they may be adversely affected by plant or transmission line construction, operation, or refurbishment</p> <p>Habitats identified by Federal, State, regional, local, or affected Native American tribal agencies as unique, rare, or of priority for protection, if these areas may be adversely affected by plant or transmission line operation and maintenance</p> <p>Wetlands (Executive Order 11990), floodplains (Executive Order 11988), or other resources specifically protected by Federal regulations or Executive Orders, or by State, regional, local, or affected Native American tribal regulations</p> <p>Land areas identified as “critical habitat” for species listed as threatened or endangered by the U.S. Fish and Wildlife Service</p> |

(4) In the case of commercially or recreationally valuable species, list those that could be adversely impacted by LR, and in addition to the applicant’s ER, consult with State or local agencies or organizations that maintain records of harvest levels of these species.

(5) Review the available site-specific data for adequacy, accuracy, and completeness.

The input to the SEIS should include descriptions of the onsite and offsite areas potentially affected by LR. The input should be brief and should contain the following information:

- the principal terrestrial ecological features of the site and vicinity and those sensitive offsite areas affected by transmission and access corridors and related facilities, with emphasis on the communities of the ecosystem that will be potentially affected by plant refurbishment and operation during the renewal term.
- wildlife sanctuaries, natural areas, and related areas that could be affected by refurbishment or operation during the renewal period
- a discussion of “important” terrestrial species that may be affected by plant refurbishment and operation during the renewal term. Estimates of their abundance should be provided where appropriate. Special habitat and forage needs should be emphasized, if the proposed project would potentially disrupt these needs.
- a summary of consultations with appropriate Federal and/or State agencies.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the kinds of terrestrial ecological resources that could be affected by plant refurbishment and operation during the renewal period, by the nature and magnitude of the expected impacts on these resources, and by the analyses required for the ESRP/S1s in Chapters 3 and 4. Information that may be included in the SEIS is described in Review Procedures.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission’s regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51, Appendix A, “Format for Presentation of Material in Environmental Impact Statements.”

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Supplement to final environmental impact statement.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

50 CFR 17.11, “Fish and wildlife.”

50 CFR 17.12, “Plants.”

Bald and Golden Eagle Protection Act of 1940, as amended, 16 USC 668 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Executive Order 11988, “Floodplain Management.”

Executive Order 11990, “Protection of Wetlands.”

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

Migratory Bird Treaty Act, as amended, 16 USC 703 et seq.

U.S. Nuclear Regulatory Commission (NRC). Regulatory Guide 4.11, Rev. 1. 1977. *Terrestrial Environmental Studies for Nuclear Power Stations*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. Regulatory Guide 4.7, Rev. 2. *General Site Suitability for Nuclear Power Stations*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
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2.2.7 RADIOLOGICAL IMPACTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a supplemental environmental impact statement (SEIS) section describing the radiological impacts of the applicant's plant.

The scope of the review includes description of radiological impacts from nuclear power plants and the radioactive effluent releases from the applicant's plant.

Review Interfaces

The reviewer for this ESRP should provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.2.3. Provide historical annual releases of radioactive material in liquid effluents.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.

October 1999

2.2.7-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



U.S. NUCLEAR REGULATORY COMMISSION
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- ESRP/S1 4.3. Provide historical annual releases of radioactive material in liquid and gaseous effluents and of solid waste generated noting any projected changes in quantities expected during renewal term operations. Also provide the calculated maximum individual doses.

- ESRP/S1s 5.1, 6.1, 6.2.1, and 6.3. Provide data on the historical radiological releases in support of the analysis of postulated accidents, fuel cycle and transportation impacts, and generation and storage of radioactive waste.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed::

- a description of the liquid and gaseous radioactive waste management and effluent control systems (from ESRP S1 2.1.4)
- historical maximum individual doses (from the applicant's annual Environmental Operating Reports)
- information on the radiological impacts of refurbishment (from the site visit)
- information on the changes in radiological impacts from operation that are expected during the renewal term (from the site visit).

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory and descriptive paragraphs prepared under this ESRP/S1 are consistent with the intent of the following regulation:

- 10 CFR 51.53(c) with respect to providing a descriptive framework for assessing the radiological impacts associated with refurbishment and operation during the renewal term.

Regulatory positions and specific criteria necessary to meet the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996; NRC 1999a), describes the radiological impacts of nuclear power plants and the staff conclusions related to the radiological impacts of license renewal (LR).
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999c) provides guidance on preparation of environmental reports associated with license renewal.

Technical Rationale

The technical rationale for describing radiological impacts of nuclear plants is discussed in the following paragraph:

The radiological impacts are an adverse environmental effect of nuclear power plants. This section is descriptive in nature and presents information necessary for the evaluation of the significance of the environmental impacts associated with the radioactive waste management and effluent control systems. The descriptions should be in sufficient detail to form an adequate basis for staff analysis of radiological impacts of refurbishment and operation during the renewal term.

III. REVIEW PROCEDURES

The SEIS section to be prepared on the radiological impacts is informational in nature. No specific analysis is required. The following review steps are suggested:

- (1) Review the discussion of radiological impacts in Section 2.3.7 of NUREG-1437 (NRC 1996).
- (2) Obtain historic information on releases of radioactive materials from the applicant's plant.
- (3) Obtain information on expected releases and exposures related to refurbishment, if any.
- (4) Obtain information on changes in releases and exposures from operations during the renewal term, if any.
- (5) Prepare a section describing radiological impacts for the SEIS. The use of tables may assist data organization in the SEIS. This section should include summary descriptions of the applicant's radiological environmental monitoring program. It should also include a discussion of doses to the maximally exposed individual for the most recent calendar year and the trend of such doses for the most recent 5 years of plant operation. Doses should be compared with relevant regulatory requirements, e.g., Appendix I to 10 CFR part 50 and 10 CFR 20.1301(d).

IV. EVALUATION FINDINGS

The level of detail of SEIS input will depend on site-specific factors. The information included in the SEIS should be scaled according to the anticipated magnitudes of the expected impacts. The reviewer should verify that the radiological impact descriptions are consistent, accurate, and given in sufficient detail to serve the needs of the reviewers for ESRP/S1s in Chapters 3, 4, and 5.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 20.1301, "Dose limits for individual members of the public."

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437 Vol. 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999c. *Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Review Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.2.8 SOCIOECONOMIC FACTORS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of socioeconomic factors of the site and vicinity,^(a) region,^(b) and transmission corridor connecting the plant to the electric transmission grid.

(a) For the purpose of these environmental reviews, "site" and "vicinity" are defined as follows:

1. "Site"—The site is defined as that area of land owned or controlled by the applicant for the principal purpose of operating a nuclear power station. As a general rule, the applicant's "site boundary" should be accepted as defining the site.
2. "Vicinity"—For small sites (on the order of 2 km²), the vicinity is the area encompassed within a radius of 10 km (6 mi). For larger irregularly shaped sites, the vicinity is a band or belt 10 km (6 mi) wide surrounding the plant site. The intent is to investigate socioeconomic factors in an area in which the site makes up no more than 10% of the area. If a lake or pond is used by the station, the entire water body area should be included in the vicinity. The vicinity considered may follow natural or political boundaries.

(b) For the purposes of this ESRP, the relevant region is limited to that area necessary to include social and economic base data for (1) the county in which the proposed plant would be located, and (2) those specific portions of surrounding counties and urbanized areas (generally, up to 80 km [50 mi] from the station site) from which the refurbishment, operations, and decommissioning work forces would be principally drawn, or that would receive stresses to community services by a change of residence of these workers. Other social and economic impacts can generally be presumed to fall within the same area covered by this definition of the region.

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

The scope of the review directed by this plan should include the establishment of the nature and extent of present and planned socioeconomic factors within these areas that might be impacted or modified as a result of station refurbishment and operation during the license renewal (LR) term. Some elements of the scope may be based on previous environmental documents for the plant, updated, as appropriate, with more recent data. Descriptions of minority and low-income populations, their locations, practices, and customs have not been provided in most previous environmental documents and will have to be addressed for the first time in this ESRP. Those features of the socioeconomic environment that are not expected to result in socioeconomic impacts should be discussed briefly and in a summary manner.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1.1, 2.1.6, and 2.1.7. Obtain information on plant setting, operations and maintenance, and transmissions systems as needed to describe the facility from a socioeconomic perspective.
- ESRP/S1 2.2.1. Obtain land-use data as needed to describe offsite socioeconomic factors.
- ESRP/S1 2.3. Provide a list of the references cited in the SEIS.
- ESRP/S1s 3.6 and 4.4. Provide socioeconomic data as needed to describe community characteristics.
- ESRP/S1s 3.6.6 and 4.4.5. Provide land-use data as needed to describe historic and archeological sites and natural landmarks.

Data and Information Needs

The reviewer for this ESRP should thoroughly consult NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), before undertaking extensive data collection since some types of socioeconomic impacts may be so unlikely, based on the scale of projected activity at the plant, as not to require an extensive data collection effort.

The kinds of data and information to be evaluated will be affected by site- and station-specific factors, and the degree of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- information related to the area's economic base, including
 - important regional industry by category, including employment (from the environmental report [ER] and consultation with State and local officials)
 - size and nature of the heavy construction industry and construction labor force within the region (from the ER and consultation with State and local officials)
 - total regional labor force (from the ER and consultation with State officials)
 - regional unemployment levels and future economic outlook (from consultation with State

agencies)

- characterization of incremental onsite labor, peak number of workers and duration of the peak, the number of workers expected to commute daily, the number of workers expected to require temporary and permanent housing, and the inventory of rental and of permanent housing within 80 km of the site (Malhotra and Manninen 1981 and consultation with the applicant and State and local officials).
- information related to the area's political structure, including
 - regional political jurisdictions and tax districts, identifying those tax districts that will be directly affected by plant refurbishment, operation, and closure (from the ER and consultation with State agencies)
 - local and regional planning and administrative organizations (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- demographic information, including population forecasts (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- social-structure information, including major community structures (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- housing information, including the sales and rental market in the region, number and types of units, turnover and vacancy rates, and trends in addition to housing stock, adequacy of structures, and location of existing and projected housing (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- information about the local educational system (regional primary and secondary schools and higher institutions), including capacity and present percentage of utilization (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- public and private recreational facilities and opportunities, including present and projected capacity and percentage of utilization (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- regional tax structure and distribution of the present revenues to each jurisdiction and district (from the ER and consultation with State and local agencies)
- local plans concerning land use and zoning that are relevant to population growth, housing, and changes in land-use patterns (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies).
- social services and public facilities, including
 - present and projected water and sewer/sewage disposal facilities, including present capacity and projected percentage of utilization (from the ER and consultation with local agencies)

- present and projected police and fire capabilities, as well as Federal, State, regional, local, and affected Native American tribal agencies with emergency planning responsibilities (from the ER and consultation with local agencies)
- location of hospitals, number of medical doctors, and specialized health facilities, including present and projected capacity (from the ER and consultation with local agencies).
- information on highways and transportation systems, for example,
 - regional and local highway systems, including carrying capacity and condition of roads and highways (from the ER and consultation with State and local agencies)
 - availability and type of public transportation (from the ER and consultation with local officials)
 - modifications that might affect traffic flow to and from the station site (from the ER).
- information about distinctive communities including the characteristics of the State, Native American tribes, and the local region that may identify them as distinctive communities, such as historic districts, tourist attractions, cultural resources, and visual resources (from the ER and consultation with State, regional and local agencies, social services agencies, and affected Native American tribal agencies).

II. ACCEPTANCE CRITERIA

Acceptance criteria for evaluating community characteristics are based on meeting the relevant requirements of the following regulations:

- 10 CFR 51.45(c) with respect to analysis of socioeconomic data
- 10 CFR 51.45(d) and 51.71(d) with respect to the analyses required in the development of the ER and environmental impact statement (EIS). In accordance with 10 CFR 51.45(d), the applicant is required to submit in the environmental report information needed for evaluating these factors. Similar information is required to be present in the EIS pursuant to 10 CFR 51.71.
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information
- 10 CFR 51, Subpart A, Appendix B, with respect to findings related to the environmental effect of renewing the operating license of a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC

1999a), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), contains guidance to the applicant concerning the analysis of potential public-utility impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during renewal term station refurbishment.

Technical Rationale

The technical rationale for evaluating the applicant's description of community characteristics is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities and operations on socioeconomics, as appropriate, and address significant new information, if any.

The socioeconomic data collection effort deals both with characteristics of the proposed activity at the plant in association with LR and with characteristics of communities in the region. A key plant related socioeconomic variable is the work force. NUREG-1437 notes that besides the work force needed for normal operations, many nonpermanent personnel are required for refueling outages, ISIs, or major refurbishment. Up to 900 additional workers may be employed during these outages. During periods of extensive maintenance activities, the additional personnel will have a substantial effect on the locality. Smaller incremental employment reduces the socioeconomic significance of LR.

The significance of any given nuclear power plant to its host area will depend to a large degree on its location, with the effects generally being most concentrated in those communities closest to the plant. Major influences on the local communities include the plant's effects on employment, taxes, housing, offsite land use, economic structure, and public services. LR would mean the continuation of many of these effects, whereas plant closure (not renewing the license) would mean the loss both of plant related population and tax base. This affects both the demand for selected public services and the ability of the local communities to supply them.

III. REVIEW PROCEDURE

The reviewer's analysis of socioeconomic factors should be closely linked with the impact-assessment review described in ESRP Chapters 3.6 and 4.4 to establish the socioeconomic factors most likely to be affected by LR. With this in mind, the reviewer should take the following steps:

- (1) Review the discussion of potential impacts of refurbishment and operations activities on socioeconomics in NUREG-1437 to identify the information considered and the conclusions reached.

This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.

- (2) Determine if there is new information that should be evaluated. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information on environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovery of new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Is the information new in the sense that it post dates the analysis leading to NUREG-1437?
- (3) Describe community characteristics for those communities within the region (see the footnote in Areas of Review for definition of "relevant region") that are expected to be impacted.
- (4) Conduct an initial screening of the community structure and characteristics within an approximate 80-km (50-mi) radius of the site to make a preliminary determination of the potentially affected subregions and communities.
 - Address the following factors in the screening process to identify population influx:
 - settlement patterns
 - labor force
 - transportation
 - housing availability
 - public services
 - economics.
 - Discuss the results of the initial screening with the reviewers of ESRP/S1s 3.6 and 4.4 to establish any other predicted construction or operating impacts that might affect results of the screening process.
- (5) Describe potentially impacted areas of the region and their associated communities in the following terms (the extent and detail of the descriptions should be in proportion to the magnitude of the impacts anticipated, and only those terms necessary for subsequent impact evaluation should be used):
 - political structure
 - social structure
 - demography
 - housing
 - economic base
 - social services and public facilities
 - highways and transportation
 - water and sewer facilities
 - education
 - public safety
 - health
 - recreation
 - taxation
 - land-use planning and zoning.

Reasonably detailed information about the socioeconomic factors of the site in question is needed to assess any potential social or economic impacts that might occur as a result of plant construction or

operation. Descriptive data in the ER must be adequate for reviewers for ESRP/S1s 3.6 and 4.4 to make these determinations.

- (6) The reviewer should ensure that the socioeconomic information is adequate as a basis for assessment of the effects of refurbishment and operation of the station during the LR term, or alternatively, closure and decommissioning. The reviewer should consult with appropriate Federal, State, regional, local, and affected Native American tribal agencies to assess the accuracy of the socioeconomic characteristics.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of socioeconomic impacts.

- (7) Based on the results of the assessments listed above, prepare the following for the SEIS:

- a brief description of the work force required during refurbishment, operations in the renewal term, and decommissioning
- a discussion (qualitative or quantitative, as appropriate) of the local population(s) and public infrastructure and services that are expected to receive impacts. The discussion needs to consider minority and low-income populations.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the potential effects of refurbishment, operation during the renewal term, and decommissioning on public services.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a

Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

Malhotra, S. and D. Manninen. 1981. *Migration and Residential Location of Workers at Nuclear Power Plant Construction Sites. Profile Analysis of Worker Surveys*. NUREG/CR-2002 Vol. 2, 282 pp. 8105180378, 08553:184. PNL-3757, prepared for the U.S. Nuclear Regulatory Commission by Pacific Northwest Laboratory, Richland, Washington.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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2.2.9 RELATED FEDERAL PROJECT ACTIVITIES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) (1) directs the staff's identification, description, and environmental assessment of Federal activities that are related to the proposed operating license renewal (LR) action, and (2) identifies the possible need for another Federal agency to participate in the preparation of the supplemental environmental impact statement (SEIS) as a cooperating agency.

The scope of the review directed by this plan will be limited to directly related Federal project activities that affect renewal of the operating license. Actions related only to the granting of licenses, permits, or approvals by other Federal agencies should not be considered in this review because such activities typically receive an independent environmental review by the appropriate agency. When relevant activities are identified, the results of this review will form the basis for an assessment of the interrelationship and cumulative environmental impacts of the proposed operating LR and the related Federal activity and the potential need or desirability for another Federal agency (or in some cases, State, regional, local, and affected Native American tribal agencies) to participate in the SEIS process as a cooperating agency.

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.3. Provide a list of references cited in the SEIS.
- ESRP/S1 Chapters 3, 4, and 5. Provide information on the interrelationship and cumulative environmental impacts of the proposed operating LR and any related Federal activity.

Data and Information Needs

The reviewer for this ESRP should obtain (1) the ER for possible roles and interests of other agencies in the proposed operating LR, (2) the comments made by other agencies during the scoping process for the SEIS, and (3) consultation with Federal, state, regional, local, and affected Native American tribal agencies. The comments should be reviewed for content and for the possible need for other agencies to participate in the preparation of the SEIS as cooperating agencies.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of information on related Federal project activities and the possible need for one or more cooperating agencies in preparation of the SEIS are based on the relevant requirements of the following regulations:

- 40 CFR 1508.25 and 10 CFR 51.14(b) with respect to the scope of an environmental impact statement (EIS) and consideration of the cumulative impacts of connected, cumulative, and similar actions
- 40 CFR 1501.6, 10 CFR 51.10(b)(2), and 10 CFR 51.14 with respect to the possible need for cooperating agencies in the preparation of an EIS
- 10 CFR 51.29(a)(7) with respect to the need to identify potential cooperating agencies.

Data provided by the applicant will generally be adequate if future actions of other agencies that are connected with, cumulative with, or similar to the NRC action are identified and described in sufficient detail to enable an environmental assessment to be made.

Technical Rationale

The technical rationale for identifying related Federal project activities is discussed in the following paragraph:

The bases for the need for the information called for in this ESRP are 40 CFR 1508.25 and 40 CFR 1501.6. The Council on Environmental Quality's (CEQ's) definition of the term "scope" at 40 CFR 1508.25 calls for Federal agencies to consider the cumulative impacts of related actions that are connected, cumulative, or similar when determining the appropriate scope for an EIS. The terms "connected," "cumulative," and "similar" are defined in 40 CFR 1508.25(a). NRC has indicated that it will follow CEQ's definition of scope (10 CFR 51.14(b)). In some cases, it may be necessary or

desirable for another Federal agency to participate in preparation of the EIS when actions of the agency are related to those of NRC. The CEQ regulations provide (at 40 CFR 1501.6) for cooperating agencies in certain instances in the preparation of an EIS. NRC has indicated that it will follow (with certain exceptions) the provisions of 40 CFR 1501.6 (10 CFR 51.10(b)(2)). NRC defines the term “cooperating agency” (in 10 CFR 51.14) as a Federal agency, other than the NRC, that has jurisdiction by law or special expertise for an environmental impact being considered by NRC in an environmental document for a proposed action that can significantly affect the quality of the human environment. The definition also provides that in appropriate cases, a State, regional, local, or affected Native American tribal agency may become a cooperating agency by agreement with the Commission. When reasonably significant impacts associated with actions of another agency are identified through the ER, the scoping process, or otherwise, and these impacts are significant enough to justify the participation of the agency(ies) in the NRC EIS process, NRC staff should identify such a potential cooperating agency(ies). After the approval of NRC management, NRC staff should contact the agency(ies) regarding its interest in participating in the SEIS. If the agency(ies) chooses to participate, appropriate writing assignments and schedules for preparation of the EIS should be determined (10 CFR 51.29(a)(7)).

III. REVIEW PROCEDURES

When analyzing the related Federal project activities, the reviewer should take the following steps:

- (1) Identify the planned activities of other Federal agencies that are directly related to the proposed operating LR (i.e., that either would not be undertaken or would be of lesser scope if the renewal had not been proposed or is not approved). As noted in Section I (Areas of Review), above, activities of other Federal agencies related only to the granting of licenses, permits, or approvals should not be considered in this review.
 - When relevant Federal activities are identified, contact the EPA Office of Federal Activities for assistance and regional and local representatives of the appropriate Federal agencies to obtain relevant information.
 - When no such Federal activities can be identified, terminate the review and state that the review identified no related Federal activities.
- (2) Determine the specific relationships of each identified activity with the proposed operating LR.
- (3) Determine the significance of any related Federal activity on the proposed operating LR by conducting a preliminary analysis of each identified Federal activity to determine, in general terms, the nature and extent of the environmental impacts that would be cumulative with those of the proposed operating LR.
 - When the reviewer determines that these impacts are minor, no further consideration of the activity is required.

- As a general rule, if the Federal agency responsible for the Federal activity has determined that preparation of an EIS is required, the reviewer may conclude that the impacts are of sufficient scope to merit further analysis of the activity to determine those impacts that would be cumulative with those of the proposed operating LR.

(4) Consider whether the Federal agency should be a cooperating agency on the NRC SEIS.

(5) If the environmental impacts of the related Federal activity could be significant, conduct a further analysis of each such activity to the extent necessary to identify those probable environmental impacts (and potential benefits) that could be expected as a result of the proposed operating LR.

- Limit the impacts and benefits to be considered to those having a direct relationship with the proposed operating LR and those that will add to or subtract from an impact or benefit predicted for the proposed renewal.
- Consider only those activities associated with the primary functions of the related activity (e.g., construction and operation of a Federal facility) and, except for unusual circumstances, do not address secondary effects (such as induced industrial/community growth).
- Provide this information to the appropriate ESRP/S1 Chapter 3.0, 4.0, and 5.0 reviewers for their consideration in determining the cumulative impacts of the proposed operating LR and the related Federal activity.

(6) Ensure that the following has occurred:

- All related Federal activities have been identified.
- Their interrelationships with the proposed operating LR have been described.
- All activities having potentially significant environmental impacts have been described in sufficient detail to determine the cumulative effects of these impacts with those of the proposed operating LR. In particular, do the following:
 - Based on an overview of the proposed operating LR activities, consultations with local and regional representatives of Federal agencies, and any input supplied by cooperating agencies, determine if all Federal activities have been identified and whether their interrelationships with the proposed operating LR have been described.
 - Based on your experience and on consultation with the appropriate ESRP/S1 Chapter 3.0, 4.0, and 5.0 reviewers, determine which of the identified Federal activities will have environmental impacts that would be cumulative with impacts of the proposed operating LR and that are of sufficient magnitude to be considered in ESRP/S1 Chapter 3.0, 4.0, and 5.0 assessments of cumulative impacts.

- Ensure that the Federal activities selected for consideration have been described in sufficient detail to permit an environmental impact assessment to be made.
- Make a preliminary determination as to whether any other Federal agency (or in some cases a State, regional, local, or affected Native American tribal agency) should be contacted about their interest in becoming a cooperating agency on the NRC SEIS.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the nature of the related Federal activities and the extent to which the significant impacts of these activities (both beneficial and adverse) are cumulative with impacts of the proposed operating LR. The following information should usually be included in the SEIS:

- a list of related Federal activities and their interrelationships with the proposed operating LR
- identification of the activities that have no significant impacts and the staff's basis for this conclusion
- a brief description of the overall activity and a sufficiently detailed description of those portions of the activity related to the proposed renewal as needed to provide the necessary background information to support the assessments of cumulative impacts in ESRP Chapters 3.0, 4.0, and 5.0. These descriptions are only for those activities having potentially significant environmental impacts that would be cumulative with those of the proposed operating LR.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.10, "Purpose and scope of subpart; application of regulations of Council on Environmental Quality."

10 CFR 51.14, "Definitions."

10 CFR 51.29, "Scoping—environmental impact statement."

40 CFR 1501.6, "NEPA and Agency Planning: Cooperating Agencies."

40 CFR 1508.25, "Terminology and Index: Scope."



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2.3 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on the description of the plant, the site, and the environment.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRP (ESRP/S1):

- ESRP/S1s 2.0 through 2.2. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional plant specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. In NUREG-1437, reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 2.0 through 2.2 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering environmental impacts of refurbishment. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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3.0 ENVIRONMENTAL IMPACTS OF REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes the environmental impacts of refurbishment.

The scope of the paragraphs covered by this plan is to introduce the material from the reviews conducted under supplemental ESRPs (ESRP/S1s) 3.1 through 3.9. It includes a description of the environmental issues associated with refurbishment discussed in the NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), identification of those issues that the staff has determined to be inapplicable to the applicant's plant because of plant design, and direction of readers to SEIS sections discussing the applicable issues.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1s 3.1 through 3.9. Obtain lists of environmental issues, if any, that are applicable to the plant for which there is new and significant information.

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3.0-1

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

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3.0-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The reviewer for this ESRP may obtain the following information from the Environmental Project Manager:

- organizational structure of the SEIS
- list of environmental issues associated with refurbishment that have been determined to be inapplicable to the applicant's plant because of plant design and the reason for each determination.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses at the license renewal stage
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of draft EIS at the license renewal stage
- 10 CFR 51.95(a) with respect to preparation of a final EIS at the license renewal stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant-specific analyses are required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential environmental impacts of refurbishment is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required. Environmental issues associated with refurbishment considered in NUREG-1437 that were determined to be Category 1 issues (see the General Introduction to this volume) are listed in the following table:

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 |
|---|-----------------|--|--------------------------------|
| SURFACE-WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS) | | | |
| Impacts of refurbishment on surface-water quality | 1 | 3.4.1 | 3.3 |
| Impacts of refurbishment on surface-water use | 1 | 3.4.1 | 3.3 |
| AQUATIC ECOLOGY (FOR ALL PLANTS) | | | |
| Refurbishment | 1 | 3.5 | 3.4 |
| GROUNDWATER USE AND QUALITY | | | |
| Impacts of refurbishment on groundwater use and quality | 1 | 3.4.2 | 3.3 |
| LAND USE | | | |
| Onsite land use | 1 | 3.2 | 3.1 |
| HUMAN HEALTH | | | |
| Radiation exposures to the public during refurbishment | 1 | 3.8.1 | 3.7 |
| Occupational radiation exposures during refurbishment | 1 | 3.8.2 | 3.7 |
| SOCIOECONOMICS | | | |
| Public services: public safety, social services, and tourism and recreation | 1 | 3.7.4 3.7.4.3 3.7.4.4 3.7.4.6 | 3.6 |
| Aesthetic impacts (refurbishment) | 1 | 3.7.8 | 3.6 |

The following generic conclusions relative to impacts were reached for each of these issues: (1) a single level of significance could be assigned to the impact and (2) plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. These conclusions are appropriate for all plants or, for some issues, specific classes of plants. In the absence of new and significant information, these issues may be addressed in the SEIS without additional plant-specific analysis.

Environmental issues related to refurbishment considered in NUREG-1437 for which these conclusions could not be reached for all plants, or for specific classes of plants, are Category 2 issues. These are listed in the following table:

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555, Supplement 1 | 10 CFR 51.53(c)(3)(ii) subparagraph |
|---|-----------------|----------------------------|---------------------------------|--|
| TERRESTRIAL RESOURCES | | | | |
| Refurbishment impacts | 2 | 3.6 | 3.5.1 | E |
| THREATENED OR ENDANGERED SPECIES (FOR ALL PLANTS) | | | | |
| Threatened or endangered species | 2 | 3.9 | 3.8.1 | E |
| AIR QUALITY | | | | |
| Air quality during refurbishment (non-attainment and maintenance areas) | 2 | 3.3 | 3.2.1 | F |
| SOCIOECONOMICS | | | | |
| Housing impacts | 2 | 3.7.2 | 3.6.1 | I |
| Public services: public utilities | 2 | 3.7.4.5 | 3.6.2 | I |
| Public services: education | 2 | 3.7.4.1 | 3.6.3 | I |
| Offsite land use | 2 | 3.7.5 | 3.6.4 | I |
| Public services, transportation | 2 | 3.7.4.2 | 3.6.5 | J |
| Historic and archaeological resources | 2 | 3.7.7 | 3.6.6 | K |
| ENVIRONMENTAL JUSTICE | | | | |
| Environmental justice | NA | Not addressed | 3.6.7 | |

A plant-specific analysis, which was not addressed in NUREG-1437, is required for each Category 2 issue and for environmental justice.

The tables shown above may be included in the introductory material of SEIS Section 3 to direct readers to the specific SEIS section that deals with each issue. If there are environmental issues related to refurbishment for which new and significant information has been identified by the applicant, by the public in scoping meetings, or by the staff in independent review, the reviewer for this ESRP should prepare a table similar to the tables above that directs readers to the SEIS sections dealing with those issues.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/S1s 3.1 through 3.9. The paragraph(s) should list the types of information to be presented and describe their relationships to information presented earlier and to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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3.1 ONSITE LAND USE

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential impacts of refurbishment activities on onsite land use. The potential impacts of refurbishment activities on onsite land use were evaluated in Section 3.2 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996). Projected onsite land-use changes during refurbishment are identified as a Category 1 issue in NUREG-1437 and Table B-1 of Appendix B, Subpart A to 10 CFR 51.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment on onsite land use in NUREG-1437, (2) identification of new information related to potential impacts of refurbishment activities on onsite land use and evaluation for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 3.9. Provide a list of onsite land-use issues for which there is significant new information.

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3.1-1

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.10. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the environmental report [ER])
- any new information included in the ER on the impacts of refurbishment on onsite land use known to the applicant (since this is a Category 1 issue, the applicant is not required under 10 CFR 51.53[c][3][i] to include impacts on onsite land use in the ER)
- new and potentially significant information on the impacts of refurbishment activities on onsite land use identified by the public in scoping meetings or in correspondence related to the application for license renewal (LR).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities on onsite land use are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS
- 10 CFR 51.71(d) with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations
- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under

10 CFR Parts 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's onsite land use is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2 information developed for those open Category 2 issues applicable to the plant and any significant new information. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to the impacts of refurbishment activities on onsite land use, as appropriate, and addresses significant new information, if any.

III. REVIEW PROCEDURES

The review of potential impacts of refurbishment on onsite land use should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment activities on onsite land use in Section 3.2 of NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Determine if there is new information that should be evaluated. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of license renewal of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?

- land-use requirements affecting onsite land use. Have land-use requirements of governmental agencies that affect the site changed since the plant was constructed? If so, do the changes affect NRC's evaluation of the LR application?

If the search conducted in this step reveals new information, continue with step (3). Otherwise prepare the section for the SEIS describing the search for new information, stating the conclusion that there is no new information, and adopting the conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, continue with steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting the conclusion from NUREG-1437.

(4) Prepare a concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of Section 3.9 of the SEIS.

(5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in SEIS Section 3.9 for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be determined by the analysis required to reach a conclusion related to the potential impacts of refurbishment on onsite land use. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Onsite land use: Based on information in the GEIS, the Commission found that

“Projected onsite land use changes required during refurbishment and the renewal period would be a small fraction of any nuclear power plant site and would involve land that is controlled by the applicant.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff's site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of _____ performed for the _____. Therefore, the staff concludes that there are no impacts of onsite land use changes during refurbishment beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Onsite land use: Based on information in the GEIS, the Commission found that

“Projected onsite land use changes required during refurbishment and the renewal period would be a small fraction of any nuclear power plant site and would involve land that is controlled by the applicant.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for _____. The following new information related to the impacts of changes in onsite land use has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of changes in onsite land use during refurbishment beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Onsite land use: Based on information in the GEIS, the Commission found that

“Projected onsite land use changes required during refurbishment and the renewal period would be a small fraction of any nuclear power plant site and would involve land that is controlled by the applicant.”

(a) Include this phrase only in the final SEIS.

(b) Include this phrase only in the final SEIS.

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(c), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to the impacts of changes in onsite land use has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of changes in onsite land use during refurbishment beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statements."

(c) Include this phrase only in the final SEIS.

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.2 AIR QUALITY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential impacts of refurbishment activities on air quality and preparation of an introduction to supplemental ESRP (ESRP/S1) 3.2.1. The potential impacts of refurbishment activities on air quality in non-attainment and maintenance areas were evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996). The potential impacts of emissions from vehicles of the refurbishment work force were identified as a Category 2 issue in NUREG-1437 and Table B-1 of Appendix B, Subpart A to 10 CFR 51. The plant specific review of this issue, required by 10 CFR 51.53(c)(3)(ii)(F), is addressed in ESRP/S1 3.2.1.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment on air quality in NUREG-1437, (2) identification of new information related to potential impacts of refurbishment activities on air quality and evaluation for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

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NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.2.4. Obtain a description of the local and regional air quality.
- ESRP/S1 3.9. Provide a list of air quality issues for which there is significant new information.
- ESRP/S1 3.10. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the environmental report [ER])
- new information on the impacts of refurbishment on air quality known to the applicant (from the ER)
- new and potentially significant information on the impacts of refurbishment activities on air quality identified by the public in scoping meetings or correspondence related to the application for license renewal
- current EPA regulations related to air quality.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities on air quality are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information
- 40 CFR 50 with respect to definition of criteria pollutants and National Ambient Air Quality Standards

- 40 CFR 51, Subpart W, with respect to requirements related to determination that the proposed Federal action conforms to applicable implementation plans
- 40 CFR 81, Subpart C, with respect to attainment status designations approved by the EPA.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555 (NRC 1999b) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential air quality impacts is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in a EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on air quality, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential impacts of refurbishment on air quality should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment activities on air quality in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.

(2) Determine if there is new information that should be evaluated. The following sources of information should be included in the search for new information:

- Applicant's ER—An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- Records of public meetings and correspondence related to the application—compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- Air-quality regulations—have the air quality regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with step (3). Otherwise, prepare a section for SEIS describing the search for new information, stating a conclusion that there is none, and adopting conclusions from NUREG-1437.

- (3) Evaluate the significance of new information. If new information is significant, then continue with steps (4) and (5) of the review. Otherwise, prepare the section for SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437.
- (4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing the new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of refurbishment on air quality. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS:

The applicant has stated (if appropriate) that it is unaware of any new and significant information related to potential impacts of refurbishment activities on air quality, and no new information has been identified by the staff in review of correspondence and public meetings related to the LR application, its site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of the available information. Therefore, the staff concludes that there is no significant new information and adopted the following conclusions related to the impacts of LR activities on air quality from NUREG-1437:

(List conclusions)

A plant-specific evaluation of the potential impacts of emissions from refurbishment worker's vehicles on air quality in non-attainment and maintenance areas is presented in the SEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

The following information related to potential impacts of refurbishment activities on air quality has been identified by the staff in independent research, in review of the applicant's ER, correspondence and public meetings related to the LR application, and in its review of public comments on the draft SEIS^(b).

(List new information)

The staff has determined that the new information is not significant because it does not lead to findings that are different from those in NUREG-1437. Therefore, the staff concludes that there is no significant new information and adopts the following conclusions related to the impacts of LR activities on air quality from NUREG-1437:

(List conclusions)

A plant-specific evaluation of the potential impacts of emissions from refurbishment worker's vehicles on air quality in non-attainment and maintenance areas is presented in the SEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

(a) Include this phrase only in the final SEIS.

(b) Include this phrase only in the final SEIS.

The following information related to potential impacts of refurbishment activities on air quality has been identified by the staff in independent research and in review of the applicant's ER and correspondence and public meetings related to the LR application, and in its review of public comments on the draft SEIS^(a):

(List new information)

The staff has determined that the information constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List the specific issue and SEIS section number (e.g., 3.9.1, 3.9.2, etc.)

The staff has determined that the remaining information does not constitute significant new information. On this basis, the staff adopts the following conclusions related to the impacts of LR activities on air quality from NUREG-1437:

(List conclusions)

A plant-specific evaluation of the potential impacts of emissions from refurbishment worker's vehicles on air quality in non-attainment and maintenance areas is presented in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statement."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

(a) Include this phrase only in the final SEIS.

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR 50, “Primary and Secondary Ambient Air Quality Standards.”

40 CFR 51, Subpart W, “Determining Conformity of General Federal Actions to State or Federal Implementation Plans”

40 CFR 81, Subpart C, “Section 107 Attainment Status Designations.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.2.1 AIR QUALITY DURING REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the potential impacts of emissions from vehicles of the refurbishment work force on air quality in nonattainment and maintenance areas at or near the plant. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant is required by 10 CFR 51.53 (c)(3)(ii)(F) to address the issue in its environmental report (ER) if the plant is located in or near a nonattainment or maintenance area. A nonattainment area is an area designated by the EPA or a State in which air quality is not in compliance with a National Ambient Air Quality Standard (40 CFR 50) for one or more criteria pollutants. A maintenance area is an area that a State has redesignated from nonattainment to attainment.

The scope of the review directed by this plan includes (1) determination of air quality and the status of compliance with National Ambient Air Quality Standards in the region of the plant, (2) identification of nonattainment and maintenance areas near the plant, (3) estimation of emissions from vehicles of refurbishment workers, (4) estimation of the potential impacts of emissions from vehicles of the refurbishment workers on air quality in nonattainment and maintenance areas near the plant, and (5) identification and evaluation of measures to mitigate the impacts if the potential impacts are MODERATE or LARGE.

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3.2.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer should obtain input from or provide input to the reviewers of information covered by the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1. Obtain descriptions of estimated refurbishment work force and schedule.
- ESRP/S1 2.1.1. Obtain a description of the plant location.
- ESRP/S1 2.2.4. Obtain descriptions of the topography, meteorology, and air quality in the region of the plant.
- ESRP/S1 2.2.8. Obtain descriptions of the locations of residential areas likely to be used by the refurbishment work force, roads likely to be used by the workers, and traffic conditions on those roads.
- ESRP/S1 3.10. Provide a summary of the analysis performed and conclusion reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- air quality data, including locations of designated nonattainment and maintenance areas near the plant (from the ER)
- normal operation workforce, normal outage workforce, and refurbishment workforce size as a function of time (from the ER)
- refurbishment work schedule, including information on when major activities are likely to occur (month and year) and on whether work will be limited to day shift or will occur on all shifts (from the ER)
- daily transportation routes used by refurbishment work force with existing/forecast traffic levels (from the ER)
- vehicle occupancy and vehicle emission rate assumptions (from the ER)
- representative meteorological data for the site and region for use in air-quality modeling (from the ER)

- topographic data (from the ER)
- proposed measures to mitigate impacts to air quality in nonattainment and maintenance areas (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of vehicle exhaust emissions on air quality in nonattainment and maintenance areas are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c)(3)(ii)(F) with respect to requiring an assessment of vehicle exhaust emissions anticipated at the time of the peak of the refurbishment workforce
- 10 CFR 51.70(b) with respect to permitting an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to giving consideration to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51, Subpart A, Appendix B, Table B-1, with respect to the definition of the issue to be addressed
- 40 CFR 50 with respect to definition of criteria pollutants and National Ambient Air Quality Standards
- 40 CFR 51, Subpart W, with respect to requirements related to determination that the proposed Federal action conforms to applicable implementation plans
- 40 CFR 51, Appendix W, with respect to air quality models
- 40 CFR 81, Subpart C, with respect to attainment status designations approved by the EPA.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.

- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR Parts 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal (LR).
- Regulatory Guide 1.23, *Onsite Meteorological Programs* (NRC 1972), and ESRP 2.7 in NUREG-1555 provide guidance on onsite meteorological measurements for use in licensing applications.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.
- EPA Publication AP-42, *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources; Volume II: Mobile Sources* (EPA 1985), provides guidance on emission rates for use in conformity determination.

Technical Rationale

The technical rationale for evaluating the applicant's meteorological and air quality data is discussed in the following paragraphs:

According to the analysis in NUREG-1437, air quality impacts for license renewal refurbishment activities are generally expected to be SMALL. However, 40 CFR 51.850 prohibits Federal agencies from issuing a license for any activity that does not conform to an applicable implementation plan. Further, 40 CFR 51.853(b) requires a conformity determination for Federal actions related to activities in nonattainment or maintenance areas if the total direct and indirect emissions exceed specified values. Workforce vehicle exhaust emissions are considered direct emissions associated with the activity.

Estimates of the size of the refurbishment workforce, the schedule of refurbishment activities, and probable locations of refurbishment worker housing are needed to estimate the amount and timing of vehicle emissions.

Meteorological data representative of the site and region are needed to evaluate the potential impacts of exhaust emissions from workers' vehicles on air quality. Data for at least one full annual cycle are needed to ensure that data representative of conditions during the refurbishment period are available for dispersion modeling.

Topographic data are needed to adequately assess the effects of topography on the transport and diffusion of vehicle exhaust emissions.

Atmospheric dispersion models and assumptions for assessing the air quality impact of nonradiological atmospheric emissions are described by the EPA. Use of EPA models for air quality calculations will ensure consistency with calculations performed by other agencies.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of emissions from refurbishment workers' vehicles on air quality in nonattainment and maintenance areas.

- (1) Review the discussion of potential air-quality impacts of refurbishment in the NUREG-1437.
- (2) Determine the status of compliance with National Ambient Air Quality Standards in the vicinity of the plant. Attainment status designations are listed in 40 CFR 81, Subpart C, and updates are published in the Federal Register. Updates may also be found using the Geographical, Environmental & Siting Information System (GEn&SIS). If there are designated nonattainment or maintenance areas in the region, then continue the analysis at step (3). Otherwise, prepare a statement for the supplemental environmental impact statement (SEIS) describing the air quality in the region that
 - summarizes the air quality data reviewed
 - states that there are no designated nonattainment or maintenance areas near the plant
 - concludes that there are no impacts of emissions from refurbishment workers' vehicles on air quality in a nonattainment or maintenance area.
- (3) Determine the size of the work force at the plant during normal operations and outages and the maximum size of the plant work force during refurbishment. If the maximum size of the work force during refurbishment is larger than the work force size during an outage, then continue the analysis at step (4). Otherwise, prepare a statement for the SEIS describing the air quality in the region that
 - summarizes the air-quality data and workforce reviewed
 - states that the size of the plant work force during refurbishment is not expected to exceed the size of the work force during an normal outage
 - concludes that the impacts of emissions from refurbishment workers' vehicles on air quality in a nonattainment or maintenance area are bounded by the impacts of emissions from the vehicles of the plant work force during an outage and therefore are SMALL within the context of the analysis in NUREG-1437 and that mitigation measures are not warranted.

- (4) Estimate the vehicle exhaust emission levels for criteria pollutants and compare the estimated exhaust emission levels with threshold emission levels for conformity analysis set in 40 CFR 51.853(b)(1) and 40 CFR 51.853(b)(2) and regionally significant levels defined in 40 CFR 51.853(f). Emissions factors from the current version of AP-42 should be used. The AP-42 emission factors may be obtained through GEn&SIS. If the emission levels are above the threshold or are regionally significant, then continue the analysis at Step (5). Otherwise, prepare a statement for the EIS describing the estimated the air quality in the region and the estimated vehicular emissions that
- summarizes the air quality data, and workforce and vehicle exhaust emission estimates
 - states that the estimated emissions are below the thresholds set in 40 CFR 51.853(b)(1) and 40 CFR 51.853(b)(2) and are not regionally significant and that a conformity determination is not required
 - concludes that the impacts of emissions from refurbishment workers' vehicles on air quality in a nonattainment or maintenance area are expected to be SMALL and that mitigation measures are not warranted.
- (5) Identify and consider potential mitigation measures. Examples of traffic control measures that might be considered include adjusting work schedules to reduce emissions during periods climatologically associated with poor air quality and encouraging use of mass transit and car pools. According to 40 CFR 51.850(b) in instances where the Federal agency is licensing the action of another governmental or private entity, approval of the Federal agency must be conditioned on the other entity meeting the mitigation measures set forth in the conformity determination. Therefore, only those mitigation measures that the applicant commits to should be used to reduce estimated impacts.
- (6) Estimate the impact of pollutant emissions associated LR activities on air quality in nonattainment and maintenance areas using screening models. If the impact is not acceptable (not in conformance with applicable implementation plans), continue with the analysis. Otherwise, prepare a statement for the SEIS describing the analysis performed and estimated impact on air quality in nonattainment and maintenance areas that
- summarizes the air quality data, the workforce and vehicle exhaust emission estimates and the results of air quality modeling
 - identifies potential mitigation measures and alternatives
 - identifies mitigation measures considered and committed to by the applicant
 - states that the estimated impacts of air pollutants on air quality in nonattainment and maintenance areas are in conformance with applicable implementation plans

- concludes that the impacts of emissions from refurbishment workers' vehicles on air quality in a nonattainment or maintenance area are expected to be SMALL or MODERATE, as appropriate.
- (7) Consider additional mitigation measures, if appropriate. Use a more detailed air-quality model to estimate impacts. Prepare a statement for the SEIS describing the analysis performed and estimated impact on air quality in nonattainment and maintenance areas that
- summarizes the air quality data, the workforce and vehicle exhaust emission estimates, and the results of air quality modeling
 - identifies mitigation measures considered and committed to by the applicant
 - states the estimated impacts of air pollutants on air quality in nonattainment and maintenance areas and whether they are in conformance with applicable implementation plans
 - concludes that the impacts of emissions from refurbishment workers' vehicles on air quality in a nonattainment or maintenance area are expected to be SMALL, MODERATE, or LARGE, as appropriate.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of emissions from the vehicles of refurbishment workers on air quality in non-attainment and maintenance areas. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

The applicant has stated that the plant is not in or near any nonattainment or maintenance areas for any pollutant and the staff has confirmed that the statement is true. Therefore, the staff concludes that vehicle exhaust emissions will have no impact on air quality in a nonattainment or maintenance area.

The applicant has stated and the staff has confirmed that the plant is located in a designated non-attainment region for ozone and that Xxxx County, 15 miles east of the plant, is designated as a nonattainment region for particulate matter. The applicant has stated that the maximum workforce during the refurbishment period will not be any larger than the workforce during recent outages. A conformity determination is not required for continuing and recurring activities, such as permit renewal, where activities conducted will be similar in scope and operation to activities currently being conducted (40 CFR 51.853[c][2][ii]). Consequently, the staff concludes that the impact of vehicle exhaust emissions during refurbishment will be SMALL.

The applicant has stated and the staff has confirmed that the plant is located in a designated non-attainment region for ozone and that Xxxx County, 15 miles east of the plant, is designated as a

nonattainment region for particulate matter. The applicant has estimated a maximum refurbishment workforce of 500. Approximately 70% of the refurbishment workers are expected to reside in ACity 15 miles north of the plant, and 30% are expected to reside in BCity 20 miles west of the plant. The applicant has committed to operation of shuttle buses to the plant from both ACity and BCity during the 3-month period when the refurbishment workforce will be at its maximum. Impacts of direct and indirect ozone and particulate emissions related to refurbishment on air quality in the nonattainment areas have been estimated using the SCREENING model approved by EPA. The results of the model calculations indicate that the emissions associated with the proposed action are in conformance with the implementation plans for the nonattainment areas. On this basis, the staff concludes that the impact of vehicle exhaust emissions during refurbishment will be MODERATE and that no additional mitigation measures should be required.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 50, "Primary and Secondary Ambient Air Quality Standards."

40 CFR 51, Subpart W, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans."

40 CFR 51.850, "Prohibition."

40 CFR 51.853, "Applicability."

40 CFR 51, Appendix W, "Guidelines on Air Quality Models."

40 CFR 81, Subpart C, "Section 107 Attainment Status Designations."

U.S. Environmental Protection Agency (EPA). 1986. *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources; Volume II: Mobile Sources*. EPA Publication No. AP-42, Research Triangle Park, North Carolina.

U.S. Nuclear Regulatory Commission (NRC). 1972. Regulatory Guide 1.23. *Onsite Meteorological Programs*.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*, NUREG-1555, Washington, D.C.



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3.3 SURFACE WATER AND GROUNDWATER QUALITY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential impacts of refurbishment activities on surface water and groundwater quality. NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996) and Table B-1 of Appendix B, Subpart A to 10 CFR 51 do not list any Category 2 issues related to the effects of refurbishment on surface water and groundwater quality that require plant-specific review.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of surface water and groundwater quality issues in NUREG-1437, (2) identification of new information related to potential impacts of refurbishment activities on surface water and groundwater quality and evaluation for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.3. Obtain a description of the plant cooling water and auxiliary water systems.

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3.3-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.2.2. Obtain a description of the applicant's water use.
- ESRP/S1 2.2.3. Obtain a description of local and regional water quality.
- ESRP/S1 3.9. Provide a list of surface-water and groundwater issues, if any, for which there is significant new information.
- ESRP/S1 3.10. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on surface water and groundwater quality issues (from the environmental report [ER])
- information on the impacts of refurbishment on surface water and groundwater quality issues known to the applicant (from the ER)
- new and potentially significant information on the impacts of refurbishment activities on surface water and groundwater quality identified by the public in scoping meetings or correspondence related to the application for license renewal (LR).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities on surface water and groundwater quality are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the LR stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment

- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in the draft EIS at the LR stage
- 10 CFR 51.95(c)(4) with respect to contents of SEIS and consideration of significant new information
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555 (NRC 1999b) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential surface water and groundwater quality impacts is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the license renewal stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on surface water and groundwater quality, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential impacts of refurbishment on surface water and groundwater quality should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment activities on surface-water and groundwater quality in NUREG-1437 to identify the information considered and the conclusions reached.

This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table gives the surface water and groundwater quality issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--------------------------------|
| SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS) | | |
| Impacts of refurbishment on surface water quality | 1 | 3.4.1 |
| Impacts of refurbishment on surface water use | 1 | 3.4.1 |
| GROUNDWATER USE AND QUALITY | | |
| Impacts of refurbishment on groundwater use and quality | 1 | 3.4.2 |

(2) Determine if there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new

information found, presenting results of the evaluation of significance, and adopting the conclusion from NUREG-1437.

- (4) Prepare concise statements of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437, modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluations of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of refurbishment on surface water and ground water quality. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Impacts of refurbishment on surface water quality: Based on information in the GEIS, the Commission found that

“Impacts are expected to be negligible during refurbishment because best management practices are expected to be employed to control soil erosion and spills.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of _____ performed for the _____. Therefore, the staff concludes that there are no impacts of refurbishment on surface water quality beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Impacts of refurbishment on surface water quality: Based on information in the GEIS, the Commission found that

-
- (a) Include this phrase only in the final SEIS.

“Impacts are expected to be negligible during refurbishment because best management practices are expected to be employed to control soil erosion and spills.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on surface water quality has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of refurbishment on surface water quality beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Impacts of refurbishment on surface water quality: Based on information in the GEIS, the Commission found that

“Impacts are expected to be negligible during refurbishment because best management practices are expected to be employed to control soil erosion and spills.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on surface water quality has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of refurbishment on surface water quality beyond those discussed in the GEIS.

-
- (a) Include this phrase only in the final SEIS.
 - (b) Include this phrase only in the final SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.4 AQUATIC ECOLOGY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential impacts of refurbishment activities on aquatic ecology. The potential impacts of refurbishment activities on aquatic ecology were evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants* (NRC 1996). Aquatic ecology issues are identified as Category 1 issues in Table B-1 of Appendix B, Subpart A to 10 CFR 51.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment on aquatic ecology in NUREG-1437, (2) identification of new information related to potential impacts of refurbishment activities on aquatic ecology and evaluation for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.3. Obtain a description of the plant cooling water and auxiliary water systems.
- ESRP/S1 2.2.5. Obtain a description of the aquatic resources in the region.

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3.4-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.9. Provide a list of the aquatic ecology issues for which there is significant new information.
- ESRP/S1 3.10. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on aquatic ecology issues (from the environmental report [ER])
- information on the impacts of refurbishment on aquatic ecology issues known to the applicant (from the ER)
- new and potentially significant information on the impacts of refurbishment activities on aquatic ecology identified by the public in scoping meetings or correspondence related to the application for license renewal (LR).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities on aquatic ecology are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the LR stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft EIS at the LR stage

- 10 CFR 51.95(c)(4) with respect to contents of SEIS and consideration of significant new information
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential aquatic ecology impacts is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the license renewal stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on aquatic ecology issues, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential impacts of refurbishment on aquatic resources should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment activities on aquatic ecology in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table gives the aquatic ecology issue that was addressed in NUREG-1437 for which a generic conclusion was reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|----------|------------------------|
| AQUATIC ECOLOGY (FOR ALL PLANTS) | | |
| Refurbishment | 1 | 3.5 |

(2) Determine if there is new information on this issue that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of license renewal of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for license renewal?

If the search conducted in this step reveals new information, then continue with step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusion from NUREG-1437.

(4) Prepare concise statements of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of the SEIS.

(5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of refurbishment on aquatic ecology. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Refurbishment: Based on information in the GEIS, the Commission found that

“During plant shutdown and refurbishment there will be negligible effects on aquatic biota because of a reduction of entrainment and impingement of organisms or a reduced release of chemicals.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of _____ performed for the _____. Therefore, the staff concludes that there are no impacts of refurbishment on aquatic biota beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Refurbishment: Based on information in the GEIS, the Commission found that

“During plant shutdown and refurbishment there will be negligible effects on aquatic biota because of a reduction of entrainment and impingement of organisms or a reduced release of chemicals.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on aquatic ecology has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff

(a) Include this phrase only in the final SEIS.

(b) Include this phrase only in the final SEIS.

concludes that there are no impacts of refurbishment on aquatic biota beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Refurbishment: Based on information in the GEIS, the Commission found that

“During plant shutdown and refurbishment there will be negligible effects on aquatic biota because of a reduction of entrainment and impingement of organisms or a reduced release of chemicals.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on aquatic biota has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of refurbishment on aquatic biota beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission’s regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51.45, “Environmental report.”

(a) Include this phrase only in the final SEIS.

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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3.5 TERRESTRIAL ECOLOGY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of an introduction to the supplemental environmental impact statement (SEIS) section on potential impacts of refurbishment activities on terrestrial ecology. The potential impacts of the refurbishment work force and refurbishment activities on terrestrial ecology were identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal is required to perform a plant-specific review of this issue by 10 CFR 51.53(c)(3)(ii)(E). The issue is addressed specifically in ESRP/S1 3.5.1.

The scope of the review directed by this plan includes review of the discussion of potential impacts of refurbishment on terrestrial ecology in NUREG-1437 and preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s as appropriate for the specific refurbishment activities planned by the applicant:

- ESRP/S1 2.1.1. Obtain a description of the plant's external appearance and setting.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.7. Obtain a description of the power-transmission system.
- ESRP/S1 2.2.1. Obtain a description of the land use in the vicinity of the plant.
- ESRP/S1 2 2.6. Obtain a description of the terrestrial resources in the vicinity of the plant.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP/S1 should obtain the proposed organizational structure for the SEIS from the Environmental Project Manager:

II. ACCEPTANCE CRITERIA

The introductory paragraph prepared under this ESRP/S1 should be consistent with the intent of the following regulations:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- There are no regulatory positions specific to this ESRP/S1.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential terrestrial ecology impacts is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is introductory in nature; and no specific analysis of data is required.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP/S1 should prepare at least one introductory paragraph for the SEIS. The paragraph(s) should introduce the material to be presented by the reviewer for ESRP/S1 3.5.1. The introduction should list the types of information to be presented and describe its relationship to information presented elsewhere in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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3.5.1 REFURBISHMENT IMPACTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of potential impacts to the terrestrial ecosystem from refurbishment activities. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required to address the issue in its environmental report (ER) if the plant intends to conduct refurbishment activities.

The scope of the review directed by this plan should include an analysis of both onsite and offsite refurbishment activities, including any new transmission line and access corridor construction. The assessment should be in sufficient detail to (1) predict and evaluate the significance of potential impacts to "important" species and their habitats and (2) evaluate how these impacts should be considered in the LR decision. "Important" species are defined in ESRP/S1 Table 2.2-6. If necessary, the reviewer should suggest consideration of alternative designs or refurbishment practices, or licensee commitments to mitigate the intensity of environmental impacts.

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.1. Obtain information about the power plant's external appearance and layout after refurbishment in enough detail to support the analyses made in ESRP/S1 3.5.1.
- ESRP/S1 2.1.7. Obtain information about refurbishment of the power transmission system in enough detail to support the analyses made in ESRP/S1 3.5.1.
- ESRP/S1 2.2.6. Obtain a description of the "important" terrestrial species and habitats of the site and vicinity that are potentially affected by refurbishment.
- ESRP/S1 3.6.4. Provide information regarding refurbishment impacts to offsite land use so that the evaluation of impacts to the terrestrial ecosystem can be completed.
- ESRP/S1 3.10. Provide a summary statement describing material reviewed, analyses performed, and conclusions reached. This should be limited to the more significant impacts, such as modification of habitat for "important" species.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

No offsite habitat loss is expected to occur. The potential onsite loss of plant and animal habitat resulting from laydown areas and possible construction of new waste storage facilities is the principal terrestrial ecological concern.

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of potential impacts. The following data or information may be needed:

- A site map showing refurbishment laydown areas, new waste storage facilities and any other structures to be added to the existing plant or infrastructure onsite, land to be cleared, waste disposal areas, and the site boundary (from the ER).

If there will be no construction of new waste facilities or other refurbishment activities requiring the creation of laydown areas, increased residential or commercial growth in nearby communities, onsite or offsite transmission line expansions, or rebuilding of structures to support existing power lines onsite or offsite, then the data and information needs are fulfilled. If any of the above activities will occur as part of the refurbishment process, then the reviewer for this ESRP should obtain the following information:

- the proposed schedule of refurbishment activities
- onsite clearing methods; temporary and permanent erosion, run-off, and siltation control methods; dust suppression methods; and other construction practices for control or suppression specific to the site (from the ER)
- the total area of land to be disturbed onsite (from the ER), including
 - the area to be covered by laydown areas, new waste storage facilities, and any other structures to be added to the existing plant or infrastructure onsite (from the ER)
 - the area(s) to be used on a short-term basis during refurbishment (e.g., laydown areas), and plans for restoration of this land (from the ER)
 - the maximum area of soil to be exposed at any one time onsite (from the ER)
 - the onsite area (hectares) of each plant community and habitat type to be cleared or disturbed (e.g., marshes, agricultural fields, and deciduous forests) and how much is being destroyed relative to the total amount present in the region (from the ER)
- any proposed refurbishment activity expected to impact important terrestrial species or habitats (from the ER)
- documentation that the applicant has consulted with the appropriate Federal and/or State agencies where such consultation is required (from the ER)
- identification of other Federal and State projects within the region that affect or could potentially affect the same threatened and endangered species (or their habitats) that occur on or near the site (from the ER).

If transmission corridor refurbishment activities are planned, the reviewer for this ESRP should obtain the following data and information about onsite and offsite transmission corridors:

- clearing methods, erosion, run-off and siltation-control methods (both temporary and permanent), dust-suppression methods, and other construction practices for impact control or minimization specific to the proposed changes to the existing transmission system (from the ER).

In addition to the specific site and vicinity information listed here, additional background information is needed to review the impacts of refurbishment on the terrestrial ecosystem. This background information should be obtained from ESRP/S1 2.2.6 and the ER, general literature, and from consultation with Federal and/or State agencies.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of impacts to the terrestrial ecosystem from refurbishment activities are based on the relevant requirements of the following regulations:

- 10 CFR 51.71(d) with respect to including in the environmental impact statement (EIS) information on impacts to the terrestrial environment due to construction
- Bald and Golden Eagle Protection Act with respect to the prohibition of taking, possessing, selling, transporting, importing, or exporting the bald or golden eagle, dead or alive, without a permit
- Coastal Zone Management Act with respect to natural resources, and land or water use of the coastal zone
- Endangered Species Act with respect to identifying impacts to threatened or endangered species and critical habitats by means of informal and/or formal consultations with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- Fish and Wildlife Coordination Act with respect to consideration of fish and wildlife resources and the planning of development projects that affect water resources
- Migratory Bird Treaty Act with respect to declaring that it is unlawful to take, import, export, possess, buy, sell, purchase, or barter any migratory bird. Feathers or other parts of nests or eggs, and products made from migratory birds are also covered by the Act. "Take" is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping, or collecting.

Regulatory positions and specific criteria in support of the regulations and other statutory requirements identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to plant-specific evaluation of the impacts of refurbishment on the terrestrial ecosystem.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999), provides guidance to the staff on reviewing ERs associated with license application under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.11, Rev. 1, *Terrestrial Environmental Studies for Nuclear Power Stations* (NRC 1977), contains technical information for the design and execution of terrestrial environmental studies, the results of which may be appropriate for inclusion in the applicant's ER. The reviewer should ensure that the appropriate results are included in the ER.

Technical Rationale

The technical rationale for evaluating the applicant's potential impacts to the terrestrial ecosystem from refurbishment is discussed in the following paragraph:

The SEIS should include an analysis that considers the environmental effects of refurbishment on the terrestrial ecosystem and the alternatives available for reducing or avoiding adverse environmental effects, as well as any environmental benefits that may result from the proposed action. The acceptance criteria listed above should be used to ensure that the environmental impacts are considered with respect to matters covered by such standards and requirements.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the refurbishment on terrestrial resources. Suggested steps for the review process are as follows:

(1) Determine if, as part of the refurbishment process, there will be

- construction of new waste storage facilities
- other refurbishment activities requiring the creation of laydown areas
- increased residential or community growth in nearby communities that will affect important species or habitats
- onsite or offsite power line expansions
- rebuilding of transmission support structures onsite or offsite.

If any of these activities are expected to occur as part of LR, continue the analysis at Step (2). Otherwise, prepare a statement for the SEIS describing the impacts of refurbishment on terrestrial resources that

- summarizes the information that has been reviewed
- states that none of the above refurbishment activities are expected to occur as part of LR
- concludes that no "important" terrestrial resources will be impacted by refurbishment activities.

(2) Identify important habitats or species if these occur on the plant site.

If important habitats or species occur onsite and would be affected by refurbishment activities, continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS describing impacts of refurbishment on terrestrial resources that

- summarizes the information reviewed, including habitat and species data
- states that there are no important habitats or species present on or in the vicinity of the site that will be adversely impacted by refurbishment activities
- concludes that because no important habitats or species will be affected by refurbishment activities, the impacts are SMALL within the context of the analysis in NUREG-1437 and that mitigation is not warranted.

(3) After identifying the important habitats or species that may be impacted by refurbishment activities, quantify and qualify the extent of the potential impacts by identifying and evaluating the following:

- the areal extent of important habitats to be modified by refurbishment activities and the effects these habitat modifications might have on associated plant and/or animal populations
- the magnitude of impacts for important species and habitats that have commercial or recreational value. This may be expressed in terms of dollars, lost opportunity for recreational pursuits, percent reduction in harvest, percent loss of habitat, or other appropriate quantifiers
- mitigation measures and alternatives.

Prepare a statement for the SEIS describing expected impacts to species and habitats from refurbishment activities that

- summarizes the relevant information reviewed on refurbishment activities, species, and habitats
- describes the refurbishment activities having potential impacts on terrestrial habitats and species
- describes the important habitats and species that will be affected by refurbishment activities and estimates the magnitude of these effects
- identifies and describes potential mitigation measures and alternatives
- concludes that these impacts are SMALL, MODERATE, or LARGE within the context of the analysis in NUREG-1437.

IV. EVALUATION FINDINGS

The level of detail of the SEIS input will be governed by the attributes of the terrestrial resources that could be affected by refurbishment during LR. This section of the SEIS should present (1) a list of adverse impacts of refurbishment to terrestrial resources, (2) a list of the impacts for which there are measures or controls to limit adverse impacts and the associated measures and controls, (3) the applicant's commitments to limit these impacts, including the applicant's commitment to the use of good construction practices, and (4) the staff's evaluation of the adequacy of the applicant's measures and controls to limit adverse impacts. This information should be summarized for the reviewer of ESRP/S1 3.10.

Statements to be written for the SEIS are described in the previous section and should be included as appropriate background to the staff's findings.

If the reviewer verifies that sufficient information has been provided in accordance with the requirements of this ESRP Supplement section, then the evaluation will support one of the following concluding statements to be included in the SEIS:

The staff has reviewed the available information relative to potential impacts to terrestrial ecosystems from refurbishment. Based on this review, the staff concludes that the potential impacts are SMALL and mitigation is not warranted.

The staff has reviewed the available information relative to potential impacts to terrestrial ecosystems from refurbishment, including mitigation measures and alternatives. Based on this review, the staff concludes that the potential impacts are (MODERATE or LARGE). Potential mitigation measures have been identified and evaluated.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

Bald and Golden Eagle Protection Act of 1940, as amended, 16 USC 668 et. seq.

Coastal Zone Management Act, as amended, 16 USC 1451 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

Migratory Bird Treaty Act, as amended, 16 USC 703 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1977. Regulatory Guide 4.11, Rev. 1. *Terrestrial Environmental Studies for Nuclear Power Stations*.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.6 SOCIOECONOMIC IMPACTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential impacts of refurbishment activities on socioeconomics and preparation of introductions to supplemental environmental impact statement (SEIS) sections prepared by reviewers of supplemental ESRPs (ESRP/S1s) 3.6.1 through 3.6.7. The potential impacts of the refurbishment work force and refurbishment activities on

- housing
- public services (water supply)
- education
- offsite land use
- transportation
- historic and archeological resources

are identified as Category 2 issues in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for LR is required to perform plant-specific reviews of these issues by 10 CFR 51.53(c)(3)(ii)(i), 10 CFR 51.53(c)(3)(ii)(J) and 10 CFR 51.53(c)(3)(ii)(K). The issues are addressed specifically in ESRP/S1s 3.6.1 through 3.6.6.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment on socioeconomic issues in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of refurbishment activities on Category 1 socioeconomic issues for significance, and (3) preparation of input to the SEIS.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Environmental justice was not addressed in NUREG-1437; therefore the staff is required to address environmental justice in the plant-specific supplements to NUREG-1437 (10 CFR 51, Subpart A, Table B-1). ESRP/S1 3.6.7 provides guidance on review of information related to environmental justice.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 2.1. Obtain a description of the plant location.
- ESRP/S1 2.2.8. Obtain descriptions of the socioeconomic conditions in the region, including the location of minority and low-income populations.
- ESRP/S1 3.9. Provide a list of the socioeconomic issues for which there is significant new information.
- ESRP/S1 3.10. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on socioeconomic issues (from the environmental report [ER])
- information on the impacts of refurbishment on socioeconomic issues known to the applicant (from the ER)
- new and potentially significant information on the impacts of refurbishment activities on socioeconomic issues identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities on socioeconomics are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(c) with respect to analysis of socioeconomic data in the applicant's ER

- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the license renewal (LR) stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft EISs at the LR stage
- 10 CFR 51.95(c)(4) with respect to contents of the SEIS consideration of significant new information
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants
- Executive Order 12898 (59 FR 7629) with respect to Federal actions to address environmental justice in minority and low-income populations.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential socioeconomic impacts is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to

preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on socioeconomic issues, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential impacts of refurbishment on socioeconomics should be conducted in stages to permit completion when sufficient analysis has been accomplished to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment activities on socioeconomics in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table gives the socioeconomic issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|----------|--|
| SOCIOECONOMICS | | |
| Public services: public safety, social services, and tourism and recreation | 1 | 3.7.4 3.7.4.3 3.7.4.4 3.7.4.6 |
| Aesthetic impacts (refurbishment) | 1 | 3.7.8 |

- (2) Determine whether there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:
 - the applicant’s ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant’s ER, consider the applicant’s process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
 - environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare the section for SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare the section for SEIS describing the search for new information, summarizing new information found, presenting the results of evaluation of significance, and adopting conclusions from NUREG-1437.

(4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of the SEIS.

(5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437, modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The level of detail of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of refurbishment on socioeconomics. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Public Services: public safety, social services, and tourism and recreation: Based on information in the GEIS, the Commission found that

“Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of _____ performed

(a) Include this phrase only in the final SEIS.

for the _____. Therefore, the staff concludes that there are no impacts of refurbishment on public safety, social services, and tourism and recreation beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Public Services: public safety, social services, and tourism and recreation: Based on information in the GEIS, the Commission found that

“Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on public safety, social services, and tourism and recreation has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of refurbishment on public safety, social services, and tourism and recreation beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Public Services: public safety, social services, and tourism and recreation: Based on information in the GEIS, the Commission found that

“Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on public safety, social services, and tourism and recreation has been identified

-
- (a) Include this phrase only in the final SEIS.
 - (a) Include this phrase only in the final SEIS.

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of refurbishment on public safety, social services, and tourism and recreation beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, "National Environmental Policy Act - Regulations Implementing Section 102(2)."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-income Populations.” *59 Federal Register* 7629-7633 (1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.6.1 HOUSING IMPACTS DURING REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on housing during refurbishment. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment activities on housing in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of refurbishment activities on housing for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1, and 2.1.6. Obtain a detailed description of the proposed plant refurbishment activities.
- ESRP/S1 2.2.8. Obtain a description of the local housing stock, market trends, and housing stock expansion plans, if any.

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3.6.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.9. Obtain descriptions of any new and significant information related to refurbishment.

- ESRP/S1 3.10. Provide a summary of any housing impacts during refurbishment describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 3.11. Provide a list of references cited in the SEIS.
- ESRP/S1 4.4.1. Obtain a description of the housing impacts during operations. Provide a summary of any housing impacts during refurbishment, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 8.2. If the reviewer concludes that proposed refurbishment activities will result in disproportionate adverse impacts on housing markets that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the ER)
- new information on the impacts of refurbishment on housing known to the applicant (from the ER)
- new and potentially significant information on the impacts of refurbishment activities on housing identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of work force changes during refurbishment (from the ER)
- the number of housing units, vacancy rates, price trends, and information on other projects that may be occurring during the renewal term in the vicinity of the plant (from the ER, local housing authorities, and governments, realtors, and other knowledgeable local sources).

The size of the work force required during the LR term is an important determinant of population growth. The permanent LR term work force is expected to include those personnel who were onsite during the initial license term, up to 60 additional permanent refurbishment workers per unit, and temporary refueling and maintenance workers during periodic plant outages. This is likely to be important only during periods when the housing market is tight, and housing is required for a substantial number of workers during a periodic outage.

The refurbishment period will be much like the original construction period, but will be smaller in duration and scale and will include additional safety and maintenance activities.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of housing impacts during refurbishment are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of Category 2 issues.
- 10 CFR 51, Subpart A, Appendix B, with respect to definition of the issue to be addressed.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), contains guidance to the applicant concerning the analysis of potential housing impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during station refurbishment.

Technical Rationale

The technical rationale for evaluating the applicant's potential housing impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on housing, as appropriate.

10 CFR 51, Subpart A, Appendix B, explicitly requires housing impacts during refurbishment to be considered in LR because of the site-specific and time-specific nature of housing market issues. However, housing-market issues could also be triggered by new and significant information.

III. REVIEW PROCEDURES

To analyze the impact of plant refurbishment during the renewal term on the local housing market, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of refurbishment activities on housing in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovery of new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of housing impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

NUREG-1437 states that project related housing demand is one of several factors that influence significance. In most cases, project related housing demand is so small or the local and regional housing markets are so large that no large impacts are expected. The observed relationship between demographic characteristics and projected housing impacts at the NUREG-1437 case study sites suggests that MODERATE and LARGE impacts are possible at sites located in rural and remote areas, at sites located in areas that have experienced extremely slow population growth (and thus slow growth or no growth in housing stock), or where growth control measures that limit housing development are in existence or have recently been lifted. The impact significance depends on local conditions.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on housing, proceed to Step (4). Otherwise, if the reviewer determines that there will be no impacts on housing or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the housing impacts associated with the refurbishment staff, as follows:

- Determine the refurbishment workers' housing requirements by predicting the number of workers originating from within the region and the number of in-migrants. Certain characteristics of the LR term work force (e.g., percentage residing in the study area, percentage moving into the study area, percentage of in-migrants accompanied by families) ordinarily can be assumed to be similar to those of the current plant staff.
- Predict the geographic distribution of in-migrants.
- Estimate the overall impact of in-migrants on regional income, employment, and population.
- Estimate the effects of in-migrants and induced economic activity on housing demand, housing prices and availability, and vacancy rates.^(a)

(5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices and describe the mechanisms available to these communities to plan for and accommodate change induced by plant refurbishment.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local housing markets are likely to be affected by plant refurbishment activities, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such housing market impacts. NUREG-1437 states that SMALL impacts result when no discernible change in housing availability occurs, changes in rental rates and housing values are similar to those occurring statewide, and no housing construction or conversion occurs. MODERATE impacts result when there is a discernible reduction in housing availability, rental rates and housing values exceed the inflation rate elsewhere in the state, and minor housing conversions or temporary additions occur. LARGE impacts occur when project related demand results in very limited housing availability, considerable increases in rental rates and housing values, and substantial conversion of housing units
- any mitigative measures for which credit is being taken to reduce housing market concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of housing impacts.

(6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.

(a) In estimating these impacts at the local level, the relative availability of public services among communities may be an important determining factor of the residence of new workers (see NRC 1998)

(7) Based on the results of the assessments listed above, prepare the following for the SEIS:

- a brief description of pathways by which the work force required during refurbishment in the renewal term may interact with local housing-market facts to result in MODERATE or LARGE impacts
- a statement (qualitative or quantitative, as appropriate) about the degree to which regional housing markets are expected to receive impacts, together with the significance of these impacts
- a discussion of the reasoning (e.g., based on locations of numbers of in-migrants, impacts on population, location and availability of housing) behind the estimated degree of impact
- a discussion of any mitigative measures for which credit is being taken to reduce housing market concerns.

IV. EVALUATION FINDINGS

The level of detail of SEIS input will be governed by the extent and significance of the effects of refurbishment activities on housing markets. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts from the refurbishment activities, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that the housing market will not experience impacts as a result of activities during refurbishment.

If the reviewer determines that there will be a discernible effect as a result of refurbishment activities, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

- The staff has reviewed the available information relative to local housing markets. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.
- The staff has reviewed the available information relative to local housing markets. Based on this review, the staff concludes that the impact is MODERATE. (The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.) The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

- The staff has reviewed the available information relative to local housing markets. Based on this review, the staff concludes that the impact is LARGE. (The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.) The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Vol. 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. In the Matter of Louisiana Energy Services Claiborne Enrichment Center. Docket 70-3070-ML. CLI98-3. Washington, D.C. April 3, 1998.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
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 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

3.6.2 PUBLIC SERVICES: PUBLIC UTILITY IMPACTS DURING REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on public utility services during refurbishment. Water supply was identified specifically as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER). All other public utilities are considered as Category 1 issues.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment activities on public utilities in NUREG-1437, (2) identification and evaluation of site-specific information related to potential impacts of refurbishment activities on public utilities, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1, and 2.1.6. Obtain a detailed description of the proposed plant refurbishment activities.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.2.8. Obtain a description of the local public utility system, trends, and expansion plans, if any. Concentrate on the local water supply.
- ESRP/S1 3.9. Obtain descriptions of information related to refurbishment.
- ESRP/S1 3.10. Provide a summary of any public utility impacts during refurbishment describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.
- ESRP/S1 4.4.2. Obtain a description of the public utility impacts during operations and summarize any public utility impacts during refurbishment, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 8.2. If the reviewer concludes that proposed refurbishment activities will result in adverse impacts on the regional public utility system that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternate energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and significant information (from the ER)
- information on the impacts of refurbishment on public utilities known to the applicant (from the ER)
- information on the impacts of refurbishment activities on public utilities identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of population changes (from the ER and, as appropriate, from local and regional authorities, such as local planning bodies)
- the demand for water from particular sources with which the plant may compete, especially during drought conditions, in the context of population growth and other projects that may be occurring during refurbishment in the vicinity of the plant (from the ER and, as appropriate, the affected service providers, such as the local water district or planning commission).

The utility that is least likely to accommodate growth is the local water supplies, where there is sometimes a MODERATE conflict. Because the case studies indicate that some public utilities may be overtaxed during peak periods, the impacts to public utilities could be MODERATE for other utilities in some cases, although most sites would experience only SMALL impacts.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of public utility impacts during refurbishment are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of Category 2 issues.
- 10 CFR 51, Subpart A, Appendix B, with respect to generic findings on the environmental effects of renewing the operating license of a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1 *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) contains guidance to the applicant concerning the analysis of potential public utility impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during renewal term station refurbishment.

Technical Rationale

The technical rationale for evaluating the applicant's potential public utility impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the

supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on public utilities, as appropriate.

10 CFR 51, Subpart A, Appendix B, explicitly requires water supplies during refurbishment to be considered in LR. This is because impacts can usually be judged primarily from water-supply conditions existing at the time of the project at a particular site and cannot be easily forecasted generically. A site-specific review will be necessary to determine whether impacts are likely to be SMALL or MODERATE and whether mitigation measures may be warranted.

Impacts of refurbishment activities on other public utilities generally are expected to be within the limits of NUREG-1437; however, issues with respect to public utilities could also be triggered by new and significant information.

III. REVIEW PROCEDURE

To analyze the impact of plant refurbishment activities on local public utilities, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of refurbishment activities on public utilities in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of public utility impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Overall, NUREG-1437 notes that there have been minimal impacts to most public utilities as a result of plant refurbishment. The existing capacity of public utilities was sufficient to accommodate the

small influx of plant staff, and some locales experienced a noticeable decrease in the level of demand for services with the completion of original plant construction. Although impacts to public utilities during LR would be very similar to those that occurred during past operations, an increased problem with water availability may occur in conjunction with plant demand and plant related population growth as a result of current water shortages in some areas. These shortages may result in MODERATE impacts to public water supplies at sites with limited water availability.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on public utilities, proceed to Step (4). Otherwise, if the reviewer determines that there are no impacts on local public utilities or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the public utility system impacts associated with refurbishment activities, as follows:

- Determine the population growth resulting from refurbishment activities by predicting the number of workers originating from within the region and the number of daily commuters. Certain characteristics of the LR term work force (e.g., percentage residing in the study area, percentage moving into the study area, percentage of in-migrants accompanied by families) ordinarily can be assumed to be similar to those of the current plant staff.
- Predict the geographic distribution of in-migrants.
- Estimate the overall impact of in-migrants on regional employment and population.
- Estimate the impact of other known or projected projects on demand for utilities.
- Estimate the effects of in-migrants and induced economic activity on public utility demand, especially local water supplies.

(5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices and public utility infrastructure, and describe the mechanisms available to these communities to plan for and accommodate changes induced by plant refurbishment activities.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local public utility services are likely to be affected by plant refurbishment activities, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such public utility impacts. NUREG-1437 states that impacts are SMALL if the existing public utility infrastructure (facilities, programs, and staff) could accommodate any plant related demand without a noticeable effect on the level of service. MODERATE impacts arise when the demand for public utility service or use of the public utility infrastructure is sizeable and would noticeably decrease the level of service (e.g., through water

conflicts during drought) or require additional resources to maintain the level of service. LARGE impacts would result when new programs, upgraded or new facilities, or substantial additional staff are required because of plant related demand

- any mitigative measures for which credit is being taken to reduce public utility system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of public utility impacts.

(6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.

(7) Based on the results of the assessments listed above, prepare the following for the SEIS:

- a brief description of pathways by which the work force required during refurbishment may interact with the regional public utility system to result in MODERATE or LARGE impacts
- a statement (qualitative or quantitative, as appropriate) about the degree to which regional public utility infrastructure and services are expected to receive impacts, together with the significance of these impacts
- a discussion of the reasoning (e.g., based on public utility requirements of the plant site, locations of numbers of in-migrants, impacts on population, location, and public utility routes, facilities, and services) behind the estimated degree of impact
- a discussion of any mitigative measures for which credit is being taken to reduce public utility infrastructure and service concerns.

IV. EVALUATION FINDINGS

The level of detail of SEIS input will be governed by the extent and significance of the effects of refurbishment activities on public utilities. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during refurbishment, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that the public utility system will not experience impacts as a result of refurbishment activities.

If the reviewer determines that there will be a discernible effect as a result of refurbishment activities, a

statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to the local public utility system. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to the local public utility system. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to the local public utility system. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Supplement to environmental report."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.6.3 PUBLIC SERVICES: EDUCATION

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on education during refurbishment. Education was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment activities on education in NUREG-1437, (2) identification and evaluation of site-specific information related to potential impacts of refurbishment activities on education, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1 and 2.1.6. Obtain a detailed description of the proposed plant refurbishment.
- ESRP/S1 2.2.8. Obtain a description of the local education system, trends, and expansion plans, if any.
- ESRP/S1 3.9. Obtain descriptions of any new and significant information related to refurbishment.

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.10. Provide a summary of any education impacts during refurbishment describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 3.11. Provide list of the references cited in the SEIS.
- ESRP/S1 8.2. If the reviewer concludes that proposed refurbishment activities will result in adverse impacts on the regional education system that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and significant information (from the ER)
- information on the impacts of refurbishment activities on education known to the applicant (from the ER)
- information on the impacts of refurbishment activities on education identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of population changes, with emphasis on school-age population (from the ER and from local experts, such as the affected school districts)
- the demand and supply of education services in the context of population growth and other projects that may be occurring during refurbishment in the vicinity of the plant (from the ER and from local experts, such as planning commissions and affected school districts).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of education impacts during refurbishment are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of Category 2 issues

- 10 CFR 51, Subpart A, Appendix B, with respect to generic findings on the environmental effects of renewing the operating license of a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 3.6.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) contains guidance to the applicant concerning the analysis of potential education impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during station refurbishment.

Technical Rationale

The technical rationale for evaluating the applicant's potential education impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on education, as appropriate.

10 CFR 51, Subpart A, Appendix B, explicitly requires education impacts during refurbishment to be considered in LR. NUREG-1437 notes that impacts to education that result from plant construction or refurbishment depend both upon the number of in-migrating workers (and, thus, school-aged dependents) and upon the size of the existing school system (and thus its ability to absorb additional students). Depending on their capacity, which needs to be evaluated on a case-by-case basis, some schools have had to set up temporary classrooms or hire additional staff to accommodate the influx of children.

III. REVIEW PROCEDURES

To analyze the impact of plant refurbishment activities on education, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of refurbishment activities on education in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.

(2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovery of new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.

(3) Determine, from the full scope of the education system impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Overall, NUREG-1437 notes that in most cases, minimal impacts to education are expected as a result of plant refurbishment activities. Generally, refurbishment impacts will be less than the corresponding impacts of the original construction period.

Impact determinations depend on the baseline conditions of the potentially affected school system (e.g., whether it is below, at, or exceeding maximum allowed student/teacher ratio).

Impacts to education that resulted from plant refurbishment activities are expected to depend upon the number of in-migrating workers (and, thus, school-aged dependents) and the size of the existing school system (and thus its ability to absorb additional students). In general, SMALL impacts are associated with project related enrollment increases of 3 percent or less. Based on case studies of plant construction, where impacts were similar to those expected during refurbishment, school districts typically are affected for a short period of time, and disruption to existing institutions is SMALL in most cases. However, some schools in the case studies had to set up temporary classrooms to accommodate the influx of children. At the case study sites, impacts to education during plant construction ranged from SMALL to MODERATE. Once construction was well underway, positive monetary impacts began to be experienced by some school districts where plants were located. Refurbishment impacts are expected to be SMALL in duration and scale and less likely to produce positive monetary impacts.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on the education system, then the reviewer should proceed to Step (4). Otherwise, if the reviewer determines that there are no impacts on the education system or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the education system impacts associated with the refurbishment activities, as follows:

- Predict the geographic distribution of new development and other projects happening at the same time as plant refurbishment, if any. The *combined* effect of the projects on demand for educational services is the effect that is important.
- Estimate the effects of in-migrants and induced economic activity on the education system.

- (5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices, infrastructure, and the education system, and describe the mechanisms available to these communities to plan for and accommodate changes induced by plant refurbishment activities.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local school systems are likely to be affected by plant refurbishment activities, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of changes in the education system. NUREG-1437 states that in general, SMALL impacts are associated with project related enrollment increases of 3 percent or less. Impacts are considered SMALL if there is no change in the school systems' abilities to provide educational services and if no additional teaching staff or classroom space is needed. MODERATE impacts generally are associated with 4 to 8 percent increases in enrollment. Impacts are considered MODERATE if a school system must increase its teaching staff or classroom space even slightly to preserve its pre-project level of service. Any increase in teaching staff, however small (e.g., 0.5 full-time equivalent), that occurs from hiring additional personnel or changing the duties of existing personnel (e.g., a guidance counselor assuming classroom duties) may result in MODERATE impacts, particularly in small school systems. LARGE impacts are associated with project related enrollment increases above 8 percent. Education impacts are considered LARGE if current institutions are not adequate to accommodate the influx of students or if the project related demand can be met only if additional resources (e.g., new teachers and/or classrooms) are acquired.
- any mitigative measures for which credit is being taken to reduce education system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of education impacts.

- (6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (7) Based on the results of the assessments listed above, prepare the following for the SEIS:
- a brief description of pathways by which the work force required during refurbishment may interact with the regional education system to result in MODERATE or LARGE impacts
 - a statement (qualitative or quantitative, as appropriate) about the degree to which regional education is expected to receive impacts, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on development plans and population increases) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce education

concerns.

IV. EVALUATION FINDINGS

The level of detail of SEIS input will be governed by the extent and significance of the effects of renewal term refurbishment activities on the education system. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during refurbishment, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that the education system will not experience impacts as a result of refurbishment activities.

If the reviewer determines that there will be a discernible effect as a result of refurbishment activities, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows.

- The staff has reviewed the available information relative to the education system. Based on this review, the staff concludes that the impact is SMALL and mitigation is not warranted.
- The staff has reviewed the available information relative to the education system. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

- The staff has reviewed the available information relative to the education system. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Vol. 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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**ENVIRONMENTAL STANDARD
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 OFFICE OF NUCLEAR REACTOR REGULATION

3.6.4 OFFSITE LAND USE DURING REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on offsite land use during refurbishment. Offsite land use was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment activities on offsite land use in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of refurbishment activities on offsite land use, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1 and 2.1.6. Obtain a detailed description of the proposed plant refurbishment.
- ESRP/S1 2.2.8. Obtain a description of the local offsite land use, trends, and development plans, if any.
- ESRP/S1 3.9. Obtain descriptions of any new and significant information related to refurbishment.

October 1999

3.6.4-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.10. Provide a summary of any offsite land-use impacts during refurbishment, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in ESRP/S1 3.6.4.
- ESRP/S1 4.4.3. Obtain a description of offsite land-use impacts during renewal-term operations. Provide a summary of any offsite land-use impacts during refurbishment, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 8.2. If the reviewer concludes that proposed refurbishment activities will result in adverse impacts on regional offsite land use that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and significant information (from the ER)
- information on the impacts of refurbishment on offsite land use known to the applicant (from the ER)
- information on the impacts of refurbishment activities on offsite land use identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of population changes (from the ER and from local experts such as local planning bodies)
- the land-use changes and development plans, especially in the context of population growth and other projects that may be occurring during refurbishment in the vicinity of the plant (from the ER and from local experts, such as local governments or planning bodies).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of offsite land-use impacts during refurbishment are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of Category 2 issues.

- 10 CFR 51, Subpart A, Appendix B, with respect to requirements for supplemental information required for a supplement to the applicant's ER at the operating-license stage.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 3.6.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) contains guidance to the applicant concerning the analysis of potential offsite land-use impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during refurbishment.

Technical Rationale

The technical rationale for evaluating the applicant's potential offsite land-use impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the license-renewal stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on offsite land use, as appropriate.

10 CFR 51, Subpart A, Appendix B, explicitly requires offsite land-use impacts during refurbishment to be considered in LR. A site-specific review will be necessary to determine whether impacts are likely to be SMALL or MODERATE and whether mitigation measures may be warranted.

III. REVIEW PROCEDURES

To analyze the impact of plant refurbishment activities on offsite land use, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of refurbishment activities on offsite land use in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the

applicant's ER, consider the applicant's process for discovery of new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?

- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.

(3) Determine, from the full scope of offsite land-use impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

- Generally, refurbishment impacts will be less than the corresponding impacts of the original construction period.
- Generally, based on NUREG-1437, if plant related population growth is less than 5 percent of the study area's total population, offsite land-use changes would be SMALL, especially if the study area has established patterns of residential and commercial development, a population density of at least 60 persons per square mile (2.6 km²), and at least one urban area with a population of 100,000 or more within 80 km (50 miles).
- If refurbishment related growth is between 5 and 20 percent of the study area's total population, MODERATE new land-use changes can be expected. Such impacts would most likely occur when the study area has established patterns of residential and commercial development, a population density of 30 to 60 persons per square mile (2.6 km²), and one urban area within 80 km (50 miles).

Overall, NUREG-1437 notes that there are likely to be minimal impacts to most offsite land use as a result of refurbishment activities. However, new land-use impacts could result from plant related population growth or from the use by local governments of the plant's tax payments to provide public services that encourage development.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on the offsite land use, then the reviewer should proceed to Step (4). Otherwise, if the reviewer determines that there are no impacts on offsite land use or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the offsite land-use impacts associated with the refurbishment activities, as follows:

- Determine the new land-use impacts that could result from plant related population growth or from the use by local governments of the plant's tax payments to provide public services that encourage development.
- Predict the geographic distribution of new development, if any. NUREG-1437 notes that because the residential settlement pattern of the refurbishment work force is expected to be comparable to that of the original construction work force at many nuclear plants, population-driven land-use impacts that have resulted from the original construction can be used to predict some of the offsite land-use impacts of refurbishment.

- Estimate the effects of in-migration and induced economic activity on offsite land use.
- (5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices, infrastructure, and offsite land use, and describe the mechanisms available to these communities to plan for and accommodate changes induced by refurbishment.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local land-use patterns are likely to be affected by refurbishment, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of changes in offsite land use. NUREG-1437 states that the magnitude of change to offsite land use is considered SMALL if very little new development and minimal changes to an area's land-use pattern result. MODERATE change results if considerable new development and some changes to the land-use pattern occur. The magnitude of change is LARGE if large-scale new development and major changes in the land-use pattern occur. During refurbishment, new land-use impacts could result from plant related population growth or from the use by local governments of the plants' tax payments to provide public services that encourage development
- any mitigative measures for which credit is being taken to reduce offsite land-use system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of offsite land-use impacts.

- (6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (7) Based on the results of the assessments listed above, prepare the following for the SEIS:
- a brief description of pathways by which the work force required during refurbishment may interact with the regional offsite land use to result in MODERATE or LARGE impacts
 - a statement (qualitative or quantitative, as appropriate) about the degree to which regional offsite land use is expected to receive impacts, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on development plans and population increases) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce offsite land-use concerns.

IV. EVALUATION FINDINGS

The level of detail of SEIS input will be governed by the extent and significance of the effects of

refurbishment activities on offsite land use. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during refurbishment, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that offsite land use will not experience impacts as a result of refurbishment activities.

If the reviewer determines that there will be a discernible effect as a result of refurbishment activities, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to offsite land use. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to offsite land use. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to offsite land use. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.6.5 PUBLIC SERVICES: TRANSPORTATION IMPACTS DURING REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on transportation services during refurbishment. Transportation was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(J) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment activities on transportation in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of refurbishment activities on transportation, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1 and 2.6. Obtain a detailed description of the proposed plant refurbishment.
- ESRP/S1 2.2.8. Obtain a description of the local transportation system, trends, and expansion plans, if any. Concentrate on choke points in the nearby road network.
- ESRP/S1 3.9. Obtain descriptions of any new and significant information related to refurbishment.

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3.6.5-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.10. Provide a summary of any transportation impacts during refurbishment, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.
- ESRP/S1 4.4.4. Obtain a description of the transportation impacts during the renewal term. Provide a summary of any transportation impacts during refurbishment describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 8.2. If the reviewer concludes that proposed refurbishment activities will result in adverse impacts on the regional transportation system that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information should be obtained:

- a description of the applicant's process for identifying new and significant information (from the ER)
- information on the impacts of refurbishment on transportation known to the applicant (from the ER)
- information on the impacts of refurbishment activities on transportation identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of work force changes (from the ER)
- the number of commuters along particular routes, and information on other projects that may be occurring during refurbishment in the vicinity of the plant (from the ER and local experts such as government transportation planners)
- Transportation Research Board's level of service (LOS) data for nearby road links (Transportation Research Board 1985). LOS data, when available, can be obtained from local planners, county engineers, or local or state departments of transportation.

The size of the work force required during refurbishment is an important determinant of population growth. This is likely to be important only during periods when the transportation system is near capacity, and only at selected locations. The magnitude of impacts experienced depends primarily on the state of the existing road network (including expansion plans, if any) rather than on the host-area population density.

The refurbishment period should be similar to the original construction period, but with a lower level of activity. Thus, impacts on transportation services that have occurred during construction may prove a useful model during the refurbishment. Only small impacts on transportation infrastructure and services are expected at most sites.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of transportation impacts during refurbishment are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS contents and consideration of Category 2 issues.
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on the environmental issues for LR of a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) contains guidance to the applicant concerning the analysis of potential transportation impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during refurbishment.

Technical Rationale

The technical rationale for evaluating the applicant's potential transportation impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant

new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on transportation, as appropriate.

It is explicitly required in 10 CFR 51, Subpart A, Appendix B, that transportation impacts during refurbishment be considered in LR. This is because impacts can usually be judged primarily from local road conditions existing at the time of the project at a particular site and cannot be easily forecasted generically. A site-specific review will be necessary to determine whether impacts are likely to be SMALL or MODERATE, and whether mitigation measures may be warranted.

III. REVIEW PROCEDURES

To analyze the impact of plant refurbishment during refurbishment on transportation, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of refurbishment activities on transportation in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of transportation impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Refurbishment impacts usually will be less than the corresponding impacts of construction. First, the level of activity is expected to be less. Second, the transportation system probably was augmented at the time of plant construction to accommodate the larger construction work force. Third, the refurbishment work force likely will represent a smaller increment to what has become a larger population in the vicinity of the plant. Generally speaking, if the increment of traffic expected as a result of refurbishment is SMALL, or the transportation level of service is high, it is unlikely that the impacts will be more than minor. The reviewer should be alert for worst-case situations in making this determination.

If, based on this analysis, the reviewer determines that there will be impacts on transportation, proceed to Step (4). Otherwise, if the reviewer determines that there will be no impacts on transportation or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

- (4) Analyze the transportation system impacts associated with the operating staff, as follows:
- Determine the operating staff requirements (including refurbishment workers) by predicting the number of workers originating from within the region and the number of daily commuters. Certain characteristics of the refurbishment work force (e.g., percentage residing in the study area, percentage moving into the study area, percentage of in-migrants accompanied by families) ordinarily can be assumed to be similar to those of the current plant staff.
 - Predict the geographic distribution of in-migrants (for commuting patterns).
 - Estimate the overall impact of in-migrants on regional employment and population.
 - Estimate the effects of in-migrants and induced economic activity on transportation demand, especially along routes that are at or near capacity and routes that are expected to receive increases in demand due to activity at the plant.
- (5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices and transportation infrastructure, and describe the mechanisms available to these communities to plan for and accommodate changes induced by plant refurbishment.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local transportation services are likely to be affected by plant refurbishment, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such transportation impacts. NUREG-1437 states that the significance of transportation impacts is related to the Transportation Research Board's level of service (LOS) definitions. LOS is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. Using LOS data describing existing conditions, it will be necessary to project LOS conditions that would arise from the additional traffic associated with refurbishment during shift change times when plant- and non-plant related traffic is heaviest. A general definition of each LOS is provided below.

NUREG-1437 states that LOS A and B are associated with SMALL impacts because the operation of individual users is not substantially affected by the presence of other users. At this level, no delays occur and no improvements are needed. LOS C and D are associated with MODERATE impacts because the operation of individual users begins to be severely restricted by other users, and at level D, small increases in traffic cause operational problems. Consequently, upgrading of roads or additional control systems may be required. LOS E and F are

associated with LARGE impacts because the use of the roadway is at or above capacity level, causing breakdowns in flow that result in long traffic delays and a potential increase in accident rates. Major renovations of existing roads or additional roads may be needed to accommodate the traffic flow.

- any mitigative measures for which credit is being taken to reduce transportation system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of transportation impacts.

(6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.

(7) Based on the results of the assessments listed above, prepare the following for the SEIS:

- a brief description of pathways by which the work force required during refurbishment may interact with the regional transportation system to result in MODERATE or LARGE impacts
- a statement (qualitative or quantitative, as appropriate) about the degree to which regional transportation infrastructure and services are expected to receive impacts, together with the significance of these impacts
- a discussion of the reasoning (e.g., based on freight transportation requirements to the plant site, locations of numbers of in-migrants, impacts on population, location, and transportation routes, facilities, and services) behind the estimated degree of impact
- a discussion of any mitigative measures for which credit is being taken to reduce transportation infrastructure and service concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of renewal term operations on transportation. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during refurbishment, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that the transportation system will not experience impacts as a result of refurbishment activities.

If the reviewer determines that there will be a discernible effect as a result of refurbishment activities, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to the local transportation system. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to local transportation systems. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to local transportation systems. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, “Supplement to final environmental impact statement.”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

Transportation Research Board. 1985. *Highway Capacity Manual*, Special Report 209, National Research Council, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans of Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.6.6 HISTORIC AND ARCHAEOLOGICAL RESOURCE IMPACTS DURING REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on historic and archaeological resources during refurbishment. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996a), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(K) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes analysis of the effects of the plant refurbishment on historic and archaeological resources in sufficient detail to allow the reviewer to predict potential for impacts on these resources and to evaluate the significance of such impacts and preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 2.1, and 2.2.6. Obtain a detailed description of the proposed plant refurbishment.
- ESRP/S1 3.1. Obtain description of onsite land use.
- ESRP/S1 3.9. Obtain descriptions of any new and significant information related to refurbishment.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a copy of the site map that identifies the areas of potential effects if historical and archaeological resources were to be found
- information on previous cultural resources surveys that have identified historic and archaeological resources, along with site-specific locations for those resources that are either located in or near the areas of potential effects
- information related to past evaluations of known historic and archaeological resources per significance criteria for eligibility for the “National Register of Historic Places” (36 CFR Part 60), and associated consultations with the State Historic Preservation Officer (SHPO), local preservation officials, or Native American tribal officials.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of historic and archaeological resources impacts during refurbishment are based on the relevant requirements of the following regulation:

- 10 CFR 51.53 (c)(3)(ii)(K), which requires all applicants to assess whether any historic or archaeological properties will be affected by the proposed project.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437 (NRC 1996a) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.1.3, and 5.1.3 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) contains guidance to the applicant concerning the analysis of potential impacts to historic and archaeological resources. The reviewer should ensure that the applicant’s analysis is sufficient to evaluate the impacts to such resources during refurbishment.

- Nuclear Reactor Regulation (NRR) Office Letter No. 906, Revision 1 (NRC 1996b), which includes guidance for complying with the requirements contained in the National Historic Preservation Act (NHPA) pertaining to protection and preservation of significant historic properties during operation of the plant. NRR Office Letter No. 906 is revised periodically. Obtain a copy of the latest revision for current guidance.

Technical Rationale

The technical rationale for evaluating the applicant's potential historic and archaeological impacts is discussed in the following paragraphs:

It is required in 10 CFR 51, other NRC regulations, and relevant historic laws and regulations (specifically the National Historic Preservation Act of 1966, as amended, and 36 CFR Part 800) that the agency and applicant consider potential impacts to historic and archaeological resources that are eligible for listing on the National Register of Historic Places.

The purpose of the historic and archaeological resources assessment is to ensure that such resources that are considered eligible for inclusion in the National Register of Historic Places are not adversely affected by proposed activities related to refurbishment. Historic and archaeological resources may include prehistoric or historic archaeological sites, historic properties, districts, and landscapes, as well as traditional cultural properties that may have significance for Native American tribes.

III. REVIEW PROCEDURES

To analyze the impact of plant refurbishment on historic and archaeological places, the reviewer should complete the following steps:

- (1) Review the discussion of the impacts of refurbishment activities on historic and archaeological resources in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Determine, from the full scope and location of the proposed refurbishment impacts, an assessment of whether the potential impacts will be considered to be SMALL, MODERATE, or LARGE. The following are definitions of these designations:
 - Impacts will be considered SMALL if (1) there are no significant resources on or near the site, or (2) there are significant historic or archaeological resources, but they would not be adversely affected by onsite or offsite plant refurbishment activities, and (3) conditions associated with MODERATE impacts do not occur.
 - Impacts will be considered MODERATE if historic and archaeological resources are thought by either the local historians, archaeologists, or Native American tribal members to have local significance and would contribute substantially to an area's sense of historic or traditional character.

- Impacts are considered to be **LARGE** if resources that have significant historic or archaeological value would be disturbed or would otherwise have their historic character altered through refurbishment activities.

It is unlikely that impacts considered to be either **MODERATE** or **LARGE** to historic and archaeological resources will occur at any site unless new facilities or service roads are constructed or new transmission lines are established.

(3) Analyze the historic and archaeological resources impacts associated with the refurbishment activities, as follows:

- Determine the direct and indirect impacts that could result from refurbishment related construction activities, (e.g., building new waste storage facilities, new parking areas, new access roads to existing transmission lines, or new transmission lines). Direct impacts could occur from construction or ground disturbing actions. Indirect impacts could occur from an increased work force that increases the potential for intentional or inadvertent impacts, such as illegal artifact collecting from historic and archaeological resources located in close proximity to work areas.
- Identify the geographic distribution of new development and potential effects if historic or archaeological resources were found. As part of this analysis, an evaluation of past surface-disturbing activities that might have previously impacted or destroyed historic and archaeological resources should be conducted.
- On a copy of the site map showing areas of potential effects from the refurbishment activities, identify all known historic and archaeological resources that may be either directly or indirectly affected from the proposed onsite or offsite actions.

(4) Evaluate the potential effects from refurbishment activities to known historic and archaeological sites by comparing the location and significance evaluation for individual resources to areas of potential effect from project activities. Determine if historic and archaeological resources are found to be in or near areas of potential effects, and assessment of effects can be conducted using criteria for effect and adverse effect contained in 36 CFR 800.9. Assessments of effect should involve the SHPO, local historic preservation officials, and Native American tribal members, as necessary, to ensure that all potential values are identified for specific resources. The assessment will result in one of the following conclusions:

- No effect—the proposed refurbishment activities will not affect any known significant historic and archaeological resources
- No adverse effect—the activities will affect one or more historic or archaeological resources, but the effect will not significantly alter the historic character of the resource(s)
- Adverse effect—the proposed activities will result in harm to the qualities that make one or more historic or archaeological resources significant.

- (5) If an adverse effect will result from the proposed refurbishment activities, the applicant, in consultation with the SHPO, Native American tribes, and other interested parties, should identify strategies to mitigate the impacts from refurbishment activities to significant historic and archaeological resources.

IV. EVALUATION FINDINGS

The depth and extent of the information in the assessment will be governed by the extent and significance of the effects of refurbishment operations on historic and archaeological resources. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the assessment, as appropriate.

If the reviewer concludes there are no historic or archaeological resources, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that no historic or archaeological resources are present.

If the reviewer determines that there will be a discernible effect as a result of activities during operations, a statement for the analysis should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to historic and archaeological resources. Based on this review, the staff concludes that the impact to these resources is **SMALL** and mitigation is not warranted.

The staff has reviewed the available information relative to historic and archaeological resources. Based on this review, the staff concludes that the impact is **MODERATE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **MODERATE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to historic and archaeological resources. Based on this review, the staff concludes that the impact is **LARGE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **LARGE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

36 CFR 800, "Protection of Historic Properties."

National Historic Preservation Act, as amended, 16 USC 470 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1996a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC), NRR Office Letter No. 906, Rev. 1. 1996. "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues," Office of Nuclear Reactor Regulation, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.6.7 ENVIRONMENTAL JUSTICE IMPACTS DURING REFURBISHMENT

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of environmental justice for refurbishment. Environmental justice was not addressed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and therefore is being treated as equivalent to a Category 2 issue in Table B-1 of Appendix B, Subpart A to 10 CFR 51. This issue is not addressed directly as a required analysis by the applicant in 10 CFR 51.53(c)(3)(ii). Guidelines for specific information needed for environmental-justice determinations are described in Attachment 4 to NRR Office Letter No. 906, Revision 1: "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues" (NRC/NRR 1996). NRR Office Letter No. 906 is revised periodically. Obtain a copy of the latest revision for current guidance.

The scope of the review directed by this plan should include an analysis of impacts on minority and low-income populations, the location and significance of any environmental impacts during refurbishment on populations that are particularly sensitive, and any additional information pertaining to mitigation. The descriptions to be provided by this review should be of sufficient detail to permit subsequent staff assessment and evaluation of specific impacts, in particular whether these impacts are likely to be negative and disproportionate, and to evaluate the significance of such impacts.

If an environmental impact statement (EIS) that has been prepared for the plant discusses environmental justice, and if there is no new and significant information, it may be possible to reference the previous analysis or adapt it to the proposed license-renewal action.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.1. Obtain descriptions of power transmission systems and operations.
- ESRP/S1 2.8. Obtain descriptions of the minority and low-income populations that could be disproportionately impacted by proposed project activities and the mechanisms (including socioeconomic) by which disproportionate harm could occur.
- ESRP/S1s 3.1 through 3.7. Obtain descriptions of potential environmental justice impacts, including socioeconomic (CEQ 1997) impacts and any new and significant information related to operations.
- ESRP/S1 3.10. Provide a summary of any environmental justice impacts describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.
- ESRP/S1 4.4.6. Obtain a summary of any environmental justice impacts during operations. Provide a summary of any environmental justice impacts during refurbishment describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 8.2. If the reviewer concludes that proposed activities will result in disproportionate adverse impacts on minority or low-income populations that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors and whether refurbishment is part of the application for license renewal. The level of detail should be scaled according to the anticipated magnitude of the potential impact. For potential consideration as an impact pathway, ordinarily, it is necessary that an impact extend beyond the site boundary; that is, it must affect offsite human populations. The following data or information may be needed:

- information on the potential environmental pathways that have any impact on human populations beyond the site boundary

- information on geographical distribution and customs, practices, and dependencies of minority and low-income populations. These populations may be present in scattered small groups or may have unusual customs, practices, or dependencies on specific resources that would be overlooked in a broader analysis that focuses on the majority population.^(a)

Demographic data would be available from GEn&SIS or from the Bureau of the Census block data and TIGER files, supplemented by any information on particular groups obtained from the scoping process and contacts with minority and low-income communities. The latter are also a good source for data concerning unusual customs, practices, and resource dependencies.

II. ACCEPTANCE CRITERIA

The acceptance criteria for environmental justice impacts are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants
- Executive Order 12898 (59 FR 7629) with respect to Federal actions to address environmental justice in minority and low-income populations.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for license renewal.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.4, 4.4.3, and 5.8.3 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) contains guidance to the applicant concerning the analysis of potential environmental justice impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during refurbishment.

(a) An example of unusual practices can be found at the Louisiana Energy Services Claiborne Enrichment Center application (NRC 1998), where proposed relocation of a road between two settlements could have disproportionately and adversely affected minority and low-income individuals who ordinarily walked between the two settlements.

- The Council on Environmental Quality provides guidance for addressing environmental justice, “Environmental Justice Guidance Under the National Environmental Policy Act,” CEQ Guidance December 10, 1997 (CEQ 1997).
- Guidelines for specific information requirements for environmental justice determinations are described in Attachment 4 to the latest update to NRR Office Letter No. 906: “Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues.”

Technical Rationale

The technical rationale for evaluating the applicant’s potential environmental justice impacts is discussed in the following paragraphs:

It is explicitly required in 10 CFR 51, Subpart A, Appendix B, that environmental justice be considered in license renewal. The memorandum accompanying Executive Order 12898 directs Federal agencies to consider environmental justice as part of the NEPA process. Although NRC is an independent agency, it has stated its intent to comply with the Executive Order.

The purpose of the environmental justice assessment is to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects on minority and low-income populations. These populations may be present in scattered small groups or may have unusual customs, practices, or dependencies on specific resources that would be overlooked in a broader analysis that focuses on the majority population. As a result, it is necessary to evaluate impacts for each such population and more carefully examine unusual environmental and socioeconomic pathways and dependencies that could result in disproportionately high impacts on them.

III. REVIEW PROCEDURES

The kinds of data and information required will be affected by site- and station-specific factors, and the degree of detail should be scaled according to the anticipated magnitude of the potential impact. The data requirements analysis should generally be the same for any type of environmental review that requires the preparation of an ER. Ordinarily, an environmental justice assessment would not be required for environmental impacts that remain within the plant boundary, or for environmental impacts that do not directly or indirectly affect offsite human populations. To conduct the review procedure, the reviewer should complete the following steps:

- (1) Determine which impacts are likely to be of concern and, therefore, what environmental-impact issues should be discussed. Contact the reviewers for ESRP/S1s 3.1 through 3.7 to determine whether the appropriate impact issues are being discussed.
- (2) Examine the record of the public scoping process to determine whether appropriate environmental impact issues are being discussed with respect to environmental justice.

- (3) Contact the responsible personnel of the State, regional, local, or affected Native American tribal agencies for information available in that State concerning locations, customs, practices, and resource dependencies of minority and low-income populations. For sites located on or near State boundaries, or where transmission line routes, access corridors, or offsite areas pass through more than one State, contact the responsible personnel in each affected State.

If, based on Steps (1) through (3), the reviewer determines that the environmental impacts extend past the plant boundaries and directly or indirectly affect human populations, then proceed with the analysis at Step (4). Otherwise, prepare a statement for the supplemental EIS (SEIS) to the effect that no environmental impact will adversely and disproportionately affect minority or low-income populations. An example is shown in Evaluation Findings.

- (4) If the environmental impacts either directly or indirectly affect human populations, then perform the following assessments (or review those provided by the applicant):
 - an assessment (qualitative or quantitative, as appropriate) of the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental impacts during refurbishment as compared to the population of the entire geographic area
 - an assessment (qualitative or quantitative, as appropriate) of the significance or potential significance of such environmental impacts on each minority and low-income population. Significance is determined by considering the disproportionate exposure, multiple hazard conditions, and cumulative-hazard conditions outlined in the guidance for addressing environmental justice under the National Environmental Policy Act (CEQ 1997).
 - an assessment of the degree to which each minority and low-income population would disproportionately experience any benefits compared to the entire geographic area.

Data needed for this assessment should describe or consider

- the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental impacts during refurbishment as compared to the entire geographic area, and whether these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such environmental impacts on each minority and low-income population
- the degree to which each minority or low-income population would disproportionately experience any benefits during refurbishment in comparison to the entire geographic area

- any mitigative measures for which credit is being taken to reduce environmental justice concerns
- the unique lifestyles and practices of minority and low-income communities (for example, subsistence activities or dependence on specific water supplies) that could result in disproportionate impacts from plant refurbishment.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of minority and low-income populations.

- (5) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the disproportionate adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (6) Based on the results of the assessments listed above, prepare the following for the SEIS:
- a brief description of pathways by which any environmental impact during refurbishment may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low-income populations
 - a statement (qualitative or quantitative, as appropriate) about the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental impacts during refurbishment as compared to the entire geographic area, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on locations of minority and low-income populations and the environmental pathways described in ESRP/S1 2.3) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce environmental-justice concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the identified minority and low-income populations and by the nature and magnitude of the expected impacts of refurbishment. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no disproportionately high and adverse impacts during refurbishment, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that no minority or low-income group will experience disproportionately high and adverse environmental impacts as a result of activities during refurbishment.

If the reviewer determines that there will be a disproportionately high and adverse environmental impact on some minority or low-income population as a result of activities during refurbishment, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to environmental justice. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to environmental justice. Based on this review, the staff concludes that the impact of (list) is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to environmental justice. Based on this review, the staff concludes that the impact of (list) is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

Council on Environmental Quality (CEQ). 1997. *Environmental Justice: Guidance Under the National Environmental Policy Act*. CEQ Guidance, December 10, 1997, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations." *59 Federal Register* 7629-7633 (1994).

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (NRC/NRR). 1996. "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues." NRR Office Letter No. 906, Revision 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. *In the Matter of Louisiana Energy Services Claiborne Enrichment Center*. Docket 70-3070-ML. CLI-98-3. Washington, D.C. April 3, 1998.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.7 RADIOLOGICAL IMPACTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential radiological impacts of refurbishment activities and preparation of input to supplemental environmental impact statement (SEIS) sections. NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996; NRC 1999a) and Table B-1 of Appendix B, Subpart A to 10 CFR 51, do not list any issues related to radiological impacts that require plant-specific review.

The scope of the review directed by this plan includes (1) review of the discussion of potential radiological impacts of refurbishment in NUREG-1437, (2) identification and evaluation of new information related to potential radiological impacts of refurbishment activities, and (3) preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.4. Obtain a description of changes to be made to the radiological waste treatment system as part of refurbishment.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.2.7. Obtain an estimate of radiological impacts of refurbishment, if any.
- ESRP/S1 3.9. Provide a list of the radiological issues for which there is significant new information.
- ESRP/S1 3.10. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on radiological issues (from the environmental report [ER] and site visit)
- information on the radiological impacts of refurbishment known to the applicant (from the ER and site visit)
- information on the impacts of refurbishment activities on radiological issues identified by the public in scoping meetings or in correspondence related to the application for license renewal.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of radiological impacts of refurbishment activities are based on the relevant requirements of the following regulations:

- 10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."
- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the license renewal stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft EISs at the license renewal stage

- 10 CFR 51.95(c)(4) with respect to contents of the SEIS and consideration of significant new information
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for license renewal of nuclear power plants.
- 10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996; NRC 1999a), provides the staff’s generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999c), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant’s description of potential radiological impacts is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the license renewal stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of refurbishment activities on radiological issues, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential radiological impacts of refurbishment should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the potential radiological impacts of refurbishment activities in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table shows the radiological issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|----------------------------|
| HUMAN HEALTH | | |
| Radiation exposures to the public during refurbishment | 1 | 3.8.1 |
| Occupational radiation exposures during refurbishment | 1 | 3.8.2 |

- (2) Determine if there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of license renewal of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for license renewal?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare the section for SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

- (3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new information found, presenting the results of evaluation of significance, and adopting conclusions from NUREG-1437.

- (4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential radiation impacts of refurbishment. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Radiation exposures to the public during refurbishment: Based on information in the GEIS, the Commission found that

“During refurbishment, the gaseous effluents would result in doses that are similar to those from current operation. Applicable regulatory dose limits to the public are not expected to be exceeded.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of _____ performed for the _____. Therefore, the staff concludes that there are no impacts of refurbishment on radiation exposures to the public beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Radiation exposures to the public during refurbishment: Based on information in the GEIS, the Commission found that

(a) Include this phrase only in the final SEIS.

“During refurbishment, the gaseous effluents would result in doses that are similar to those from current operation. Applicable regulatory dose limits to the public are not expected to be exceeded.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on radiation exposures to the public has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of refurbishment on radiation exposures to the public beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Radiation exposures to the public during refurbishment: Based on information in the GEIS, the Commission found that

“During refurbishment, the gaseous effluents would result in doses that are similar to those from current operation. Applicable regulatory dose limits to the public are not expected to be exceeded.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of _____ performed for the _____. The following new information related to impacts of refurbishment on radiation exposures to the public has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new

(a) Include this phrase only in the final SEIS.
(b) Include this phrase only in the final SEIS.

information, there are no impacts of refurbishment on radiation exposures to the public beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437 Vol. 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999c. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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3.8 THREATENED OR ENDANGERED SPECIES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of an introduction to the supplemental environmental impact statement (SEIS) section on refurbishment activities on threatened or endangered species. The potential impact of the refurbishment work force and refurbishment activities on threatened or endangered species is identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal is required to perform plant-specific reviews of this issue by 10 CFR 51.53(c)(3)(ii)(E). The issue is addressed specifically in ESRP/S1 3.8.1.

The scope of the review directed by this plan includes review of the discussion of potential impacts of refurbishment on threatened or endangered species in NUREG-1437, and preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s) as appropriate for the specific refurbishment activities planned by the applicant:

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.1. Obtain a description of the plant appearance and setting and a description of changes to be made during refurbishment.
- ESRP/S1 2.1.7. Obtain a description of the power transmission system and any changes to be made associated with refurbishment.
- ESRP/S1 2.2.5. Obtain a list of threatened or endangered aquatic species and sensitive habitats.
- ESRP/S1 2.2.6. Obtain a list of threatened or endangered terrestrial species and sensitive habitats.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP/S1 should obtain the proposed organizational structure for the SEIS from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The introductory paragraph prepared under this ESRP/S1 should be consistent with the intent of the following regulation:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- There are no regulatory positions specific to this ESRP/S1.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential impacts of refurbishment activities on threatened or endangered species is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is introductory in nature; no specific data analysis is required.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP/S1 should prepare at least one introductory paragraph for the SEIS. The paragraph(s) should introduce the material to be presented by the reviewer for ESRP/S1 3.8.1. The introduction should list the types of information to be presented and describe its relationship to information presented elsewhere in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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3.8.1 THREATENED OR ENDANGERED SPECIES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and evaluation of potential impacts to Federal listed threatened or endangered species or designated critical habitats, including species proposed to be listed as threatened or endangered and habitats proposed to be designated as critical, from refurbishment activities. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal is required by 10 CFR 51.53(c)(3)(ii)(E) to assess the impacts of the proposed action on threatened or endangered species or critical habitats in its environmental report (ER).

The scope of the review directed by this plan includes consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (referred to collectively as the Service) under Section 7 of the Endangered Species Act (ESA) and the preparation of input to the supplemental environmental impact statement (SEIS). The consultation process involves an analysis of the effects of onsite and offsite refurbishment activities, including any new transmission-line and access-corridor construction. The Service concludes the consultation process by rendering a decision with respect to the significance of potential impacts to listed and proposed threatened or endangered species or critical habitats with any reasonable and prudent alternatives for avoiding or reducing such impacts.

Review Interfaces

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

The reviewer should obtain input from or provide input to reviewers of information covered by the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.1. Obtain information about the power plant's external appearance and layout after refurbishment in enough detail to support the required analyses.
- ESRP/S1 2.1.3. Obtain information about the cooling intake and discharge systems if these are involved in refurbishment.
- ESRP/S1 2.1.7. Obtain information about refurbishment of the power transmission system in enough detail to support the analyses.
- ESRP/S1 2.2.5. Obtain a description of listed and proposed threatened or endangered aquatic species or critical habitats on or in the vicinity of the site.
- ESRP/S1 2.2.6. Obtain a description of listed and proposed threatened or endangered terrestrial species or critical habitats on or in the vicinity of the site.
- ESRP/S1 3.5.1. Obtain information on impacts of refurbishment on the terrestrial ecosystem as they apply to listed and proposed threatened or endangered species or critical habitats.
- ESRP/S1 3.10. Provide a summary statement describing the material reviewed, analyses performed, decisions rendered by the Service as a result of consultation, and how these should be considered in the license renewal.
- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.
- ESRP/S1 4.6.1. Provide coordination for consultations with the Service with the reviewer of ESRP/S1 4.6.1.

Data and Information Needs

If there are no planned refurbishment activities, there can be no impacts to listed and proposed threatened or endangered species or critical habitats. Thus, the data and information needs are fulfilled, and no review is required. If refurbishment activities are planned, then the NRC is required to initiate informal consultation with the Service. For this consultation, the following data or information may be need by the NRC:

- a description of the planned refurbishment activities (from the ER and ESRP/S1s 2.1.1, 2.1.3, and 2.1.7)
- a description of the listed and proposed threatened or endangered species or critical habitats on or in the vicinity of the site (from the ER and ESRP/S1s 2.2.5 and 2.2.6)

- a description of the manner in which refurbishment activities are anticipated to impact listed and proposed threatened or endangered species or critical habitats (from the ER and ESRP/S1 3.5.1 for terrestrial species).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities on threatened or endangered species are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 with respect to ERs and the analysis of potential impacts contained therein
- Endangered Species Act of 1973, as amended, with respect to identifying impacts to listed and proposed threatened or endangered species or critical habitats by means of consultation with the USFWS or NMFS.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) states that compliance with the ESA cannot be assessed without site-specific consideration of potential effects from refurbishment on listed and proposed threatened or endangered species or critical habitats.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999), provides guidance to the staff on reviewing ERs associated with license application under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's potential impacts from refurbishment to listed and proposed threatened or endangered species or critical habitats is discussed in the following paragraph:

The SEIS must include an analysis that considers the impacts of refurbishment on listed and proposed threatened or endangered species or critical habitats and reasonable and prudent alternatives for avoiding or reducing such adverse effects. The acceptance criteria listed above ensure that impacts to listed and proposed threatened or endangered species or critical habitats are considered.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the effects of refurbishment on threatened or endangered species. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of refurbishment on threatened or endangered species in NUREG-1437 and the ER. They should include results of requests to the Service listed species in the project area.
- (2) Identify potential environmental effects related to refurbishment that might impact threatened or endangered species or critical habitat.

If any potential environmental effects of refurbishment are identified that might impact threatened or endangered species or critical habitat, then continue the analysis at Step (3). Otherwise, prepare input to the SEIS stating that refurbishment will not affect the environment. Therefore, there will be no impacts on threatened or endangered species.

- (3) Initiate informal consultation with the Service to determine the likelihood of adverse affects on listed and proposed threatened or endangered species or critical habitats. The NRC will provide the Service with a description of planned refurbishment activities, a description of any listed and proposed threatened or endangered species or critical habitats that it knows to exist on or in the vicinity of the site, and a description of the manner in which refurbishment activities are anticipated to impact listed and proposed threatened or endangered species or critical habitats.

A detailed description of the procedural requirements for consultation under the ESA, including definitions of listed and proposed threatened or endangered species and critical habitats, jeopardy, adverse modification, etc., are found in USFWS (1998). This document also contains guidelines for procuring an incidental take permit.

If the consultation process finds that (1) listed threatened or endangered species or critical habitats are likely to be present on or in the vicinity of the site or (2) listed threatened or endangered species or critical habitats are definitely present on or in the vicinity of the site, and will be adversely affected, then continue the analysis at Step (4). Otherwise, prepare input for the SEIS that summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the Biological Opinion rendered by the Service and concludes that there will be *no* impacts to listed threatened or endangered species or critical habitats from refurbishment.

- (4) Initiate a biological assessment if one is requested by the Service as a prerequisite to making a finding in the informal consultation. A biological assessment is required if listed threatened or endangered species or critical habitats may be present in the area to be affected by major construction activities and is optional only if proposed threatened or endangered species or critical habitats are involved.

Although the NRC takes responsibility for the findings, the biological assessment is usually prepared by the applicant or a non-Federal representative. The biological assessment should address listed and proposed threatened or endangered species and critical habitats that are likely to be affected. The content of biological assessments prepared pursuant to the ESA are at the discretion of the NRC, although recommended contents may be found in 50 CFR 402.12. State wildlife or fisheries

agencies, Natural Heritage Programs, and State offices of The Nature Conservancy can provide useful information for designing the biological assessment.

For each proposed species or critical habitat that the Service concludes is potentially jeopardized by refurbishment, continue with the analysis at Step (5). Similarly, for each listed species or critical habitat that the Service concludes is likely to be adversely affected, continue the analysis at Step (5). For the remaining species and habitats, prepare a statement for the SEIS that (1) summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the opinion rendered by the Service and (2) concludes that there will be no impacts to listed threatened or endangered species or critical habitats from refurbishment.

- (5) Initiate formal consultation with the Service to determine if refurbishment activities are likely to jeopardize the continued existence of a listed species (jeopardy) or destroy or adversely modify critical habitat (adverse modification). The Service will render a biological opinion of jeopardy/no jeopardy and adverse modification/no adverse modification and issue an incidental take statement as warranted. The Service will also provide a list of reasonable and prudent alternatives (e.g., alternative design and/or placement of structures, alternative schedules, or alternative construction practices, habitat improvement, etc.) for avoiding jeopardy or adverse modification and minimizing incidental take. Alternatively, the Service may provide a statement that no reasonable and prudent alternatives exist, along with an explanation.

If the Service renders an opinion of no jeopardy and no adverse modification, then prepare a statement for the SEIS that (1) summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the decision rendered by the Service and (2) concludes that refurbishment will not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat.

Otherwise, if the Service renders an opinion of jeopardy and/or adverse modification, prepare a statement for the SEIS that (1) summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the decision rendered by the Service, (2) includes a list of reasonable and prudent alternatives for avoiding jeopardy and/or adverse modification, or provides a statement that no reasonable and prudent alternatives exist, (3) includes a statement regarding the magnitude of anticipated incidental take and a list of reasonable and prudent alternatives for avoiding or reducing incidental take and, if needed, procures an incidental take permit under Sections 10(a)(1)(A) and 10(a)(1)(B) of the ESA, and (4) concludes that refurbishment will jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat.

IV. EVALUATION FINDINGS

The depth and extent of input to the SEIS will be governed by the attributes of the listed and proposed threatened or endangered species or critical habitats that could be affected by refurbishment and by the magnitude of the expected impacts on these resources. This section of the SEIS should present (1) a list

of adverse impacts to listed and proposed threatened or endangered species or critical habitats from refurbishment, (2) a list of the impacts for which there are reasonable and prudent alternatives to limit adverse effects and the associated alternatives, and (3) the applicant's commitments to limit these impacts. This information should be summarized and provided to the reviewer of ESRP/S1 3.10.

If the reviewer verifies that consultation with the Service under Section 7 of the ESA is complete, then the evaluation will support one of the following concluding statements to be included in the SEIS:

The staff completed consultation with the Service relative to potential impacts to listed and proposed threatened or endangered species or critical habitats from refurbishment. Based on this consultation, the staff concludes that the impact is **SMALL**, and mitigation is not needed.

The staff has completed consultation with the Service relative to potential impacts to listed and proposed threatened or endangered species or critical habitats from refurbishment. Based on this consultation, the staff concludes that the impact is **MODERATE**. Reasonable and prudent alternatives to limit adverse effects have been identified by the Service and will be implemented as follows.

The staff has completed consultation with the Service relative to potential impacts to listed and proposed threatened or endangered species or critical habitats from refurbishment. Based on this consultation, the staff concludes that the impact is **LARGE**. Reasonable and prudent alternatives to limit adverse effects have been identified by the Service and will be implemented as follows.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

50 CFR 402.12, “Biological assessments.”

Endangered Species Act of 1973, as amended 16 USC 1531 et seq.

National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.

U.S. Fish and Wildlife Service (USFWS). 1998. *Endangered Species Act Consultation Handbook (Washington, D.C.): Procedures for Conducting Section 7 Consultations and Conferences (Final)*.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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3.9 SIGNIFICANT NEW INFORMATION RELATED TO REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of significant new information related to the potential impacts of refurbishment activities and preparation of an introductory section to the supplemental environmental impact statement (SEIS).

The scope of the review directed by this ESRP includes (1) preparation of a consolidated list of environmental issues related to refurbishment for which there is significant new information, (2) introduction of SEIS sections presenting the staff's analyses related to those issues, or (3) preparation of a short section for the SEIS stating that there are no issues related to the environmental impacts for which there is significant new information.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 3.1 through 3.8. Obtain a list of issues for which there is significant new information.
- ESRP/S1 3.10. Provide a summary of the reviews conducted and conclusions reached.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.11. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- lists of issues for which there is significant new information (from reviewers of ESRP/S1s 3.1 through 3.8)
- organizational structure of the SEIS (from the Environmental Project Manager).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment and with respect to preparation of a draft environmental impact statement (DEIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71(d) with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the significant new information is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the license renewal stage. The review conducted under this ESRP leads to preparation of a section of the SEIS that introduces the significant new information, if any.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 3.1 through 3.8 and compile a list of environmental issues for which there is significant new information. If there is no issue for which there is significant new information, then the reviewer should prepare a statement to that effect for the SEIS. Otherwise, the reviewer should prepare one or more paragraphs for the SEIS introducing the SEIS sections that present the findings of the analyses on the issues for which there is significant new information.

If there is no issue for which there is significant new information, the SEIS statement should make the following points:

- There has been a search for new information on potential environmental impacts related to refurbishment.
- The significance of new information, if any, has been assessed.
- There is no issue for which there is significant new information.

If there are issues for which there is significant new information, each issue should be addressed in a separate SEIS section. The introductory paragraphs prepared under this ESRP should identify the issue and direct the reader to the SEIS section where the issue is addressed.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare an SEIS section that either states that there is no issue for which there is significant new information or introduces the SEIS sections that discuss the issues for which there is significant new information.

If there is no issue for which there is significant new information, the reviewer should prepare a paragraph for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts associated with refurbishment in NUREG-1437 and in the applicant's environmental report, has conducted public scoping, and has conducted its own independent review. In this process, the staff did not discover any environmental issue related to refurbishment for which there is significant new information.

If there are issues for which there is significant new information, the review should prepare introductory paragraphs for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts associated with refurbishment in NUREG-1437 and in the applicant's environmental report, has conducted public scoping, and has conducted its own independent review. In this process, the staff has determined that there is significant new information related to ____ and _____. Section ____ of this SEIS describes the issue, gives the staff's analysis, and discusses mitigation alternatives for _____. Section _____ covers _____."

Where appropriate, a statement similar to the following should also be included in the SEIS:

"_____ is part of the Category 1 issue related to _____. Reconsideration of the conclusions for this issue is limited in scope to the assessment of the relevant new and significant information. The scope does not include review of other facets of the issue that are not affected by the new information."

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

50 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission. 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission. 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission. 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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3.10 SUMMARY OF IMPACTS OF REFURBISHMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section for the supplemental environmental impact statement (SEIS) that summarizes conclusions related to the environmental impacts of refurbishment.

The scope of the review directed by this plan covers collection of summary statements prepared by reviewers of supplemental ESRPs (ESRP/S1s) 3.1 through 3.9 and consolidation of the summary statements in an SEIS section. It also includes preparation of lists of unavoidable adverse impacts and irreversible or irretrievable resource commitments and evaluation of the effects of short-term use on maintenance and enhancement of long-term productivity for use by the reviewer of ESRP/S1 9.0.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1s 3.1 through 3.9. Obtain summary statements that succinctly give conclusions reached in the staff reviews.

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 9.0. Provide lists of unavoidable adverse impacts and irreversible or irretrievable resource commitments and an evaluation of the effect of short-term use on maintenance and enhancement of long-term productivity of the environment as related to refurbishment.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The reviewer for this ESRP should obtain summary statements from reviewers of ESRP/S1 3.1 through 3.9.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of refurbishment activities are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses at the license renewal stage
- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.

Technical Rationale

The technical rationale for providing a summary of conclusions at the end of the SEIS chapter is discussed in the following paragraph:

The NRC staff is required to prepare a plant specific supplement to NUREG-1437 when an application for license renewal is submitted. A summary of conclusions reached is presented at the end of each chapter in NUREG-1437. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 3.1 through 3.9 and compile a list of conclusions from the SEIS sections that the reviewers have prepared. The conclusions should be checked for completeness and prepared for inclusion in the SEIS. The conclusions should not contain references.

The reviewer for ESRP/S1 3.10, together with the other reviewers for Chapter 3 ESRP/S1s, should identify those adverse environmental effects of refurbishment that are unavoidable and commitments of resources related to refurbishment that are irreversible or irretrievable. Lists of these impacts should be provided to the reviewer for ESRP/S1 9.0 for inclusion in the SEIS summary. These reviewers should also evaluate the effects of the short-term use on maintenance and enhancement of long-term productivity of the environment. The results of this evaluation should be provided to the reviewer for ESRP/S1 9.0.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists the conclusions of the SEIS sections covering environmental impacts of refurbishment. The completed list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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3.11 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of sections of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on the environmental impacts of refurbishment.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRP (ESRP/S1):

- ESRP/S1s 3.1 through 3.9. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytical, and written in plain language

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant specific supplement to NUREG-1437 when an application for license renewal is submitted. In NUREG-1437, reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 3.1 through 3.9 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering environmental impacts of refurbishment. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission. 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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4.0 ENVIRONMENTAL IMPACTS OF OPERATION DURING THE RENEWAL TERM

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes the environmental impacts of operation during the renewal term.

The scope of the paragraphs covered by this plan introduces the material from the reviews conducted under supplemental ESRPs (ESRP/S1) 4.1 through 4.7. It includes a description of the environmental issues associated with operation during the renewal term discussed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), identification of those issues that the staff has determined to be inapplicable to the applicant's plant because of plant design, and direction of readers to SEIS sections discussing the applicable issues.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 4.1 through 4.7. Obtain lists of environmental issues, if any, that are applicable to the plant for which there is new and significant information.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The reviewer for this ESRP may obtain the following information from the Environmental Project Manager:

- organizational structure of the SEIS
- list of environmental issues associated with operation during the renewal term that have been determined to be inapplicable to the applicant's plant because of plant design and the reason for each determination.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses at the license renewal stage
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of draft EIS at the license renewal stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the license renewal stage
- 10 CFR 51, Subpart A, Appendix B, with respect to the Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant-specific analyses are required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999) provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential environmental impacts of operation is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required. Environmental issues associated with operation during the renewal term considered in NUREG-1437 that were determined to be Category 1 (see General Introduction to this Volume) issues are listed in Table 4.0-1.

Table 4.0-1. Category 1 Issues

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 |
|---|-----------------|---------------------------------|------------------------------------|
| SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS) | | | |
| Altered current patterns at intake and discharge structures | 1 | 4.2.1.2.1 4.3.2.2 4.4.2 | 4.1 |
| Altered salinity gradients | 1 | 4.2.1.2.2 4.2.2 | 4.1 |
| Altered thermal stratification of lakes | 1 | 4.2.1.2.3 4.4.2.2 | 4.1 |
| Temperature effects on sediment- transport capacity | 1 | 4.2.1.2.3 4.4.2.2. | 4.1 |
| Scouring caused by discharged cooling water | 1 | 4.2.1.2.3 4.4.2.2 | 4.1 |
| Eutrophication | 1 | 4.2.1.2.3 4.4.2.2 | 4.1 |
| Discharge of chlorine or other biocides | 1 | 4.2.1.2.4 4.4.2.2 | 4.1 |
| Discharge of sanitary wastes and minor chemical spills | 1 | 4.2.1.2.4 4.4.2.2 | 4.1 |
| Discharge of other metals in waste water | 1 | 4.2.1.2.4 4.3.2.2 4.4.2.2 | 4.1 |
| Water-use conflicts (plants with once-through cooling systems) | 1 | 4.2.1.3 | 4.1 |

Table 4.0-1. (contd)

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 |
|--|----------|--|----------------------------|
| AQUATIC ECOLOGY (FOR ALL PLANTS) | | | |
| Accumulation of contaminants in sediments or biota | 1 | 4.2.1.2.4 4.3.3 4.4.3 4.4.2.2 | 4.1 |
| Entrainment of phytoplankton and zooplankton | 1 | 4.2.2.1.1 4.3.3 4.4.3 | 4.1 |
| Cold shock | 1 | 4.2.2.1.5 4.3.3 4.4.3 | 4.1 |
| Thermal plume barrier to migrating fish | 1 | 4.2.2.1.6 4.4.3 | 4.1 |
| Distribution of aquatic organisms | 1 | 4.2.2.1.6 4.4.3 | 4.1 |
| Premature emergence of aquatic insects | 1 | 4.2.2.1.7 4.4.3 | 4.1 |
| Gas supersaturation (gas bubble disease) | 1 | 4.2.2.1.8 4.4.3 | 4.1 |
| Low dissolved oxygen in the discharge | 1 | 4.2.2.1.9 4.3.3 4.4.3 | 4.1 |
| Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses | 1 | 4.2.2.1.10 4.4.3 | 4.1 |
| Stimulation of nuisance organisms | 1 | 4.2.2.1.11 4.4.3 | 4.1 |
| AQUATIC ECOLOGY (FOR PLANTS WITH COOLING TOWER BASED HEAT DISSIPATION SYSTEMS) | | | |
| Entrainment of fish and shellfish in early life stages | 1 | 4.3.3 | 4.1 |
| Impingement of fish and shellfish | 1 | 4.3.3 | 4.1 |
| Heat shock | 1 | 4.3.3 | 4.1 |

Table 4.0-1. (contd)

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 |
|---|----------|------------------------|----------------------------|
| GROUNDWATER USE AND QUALITY | | | |
| Groundwater-use conflicts (potable and service water, and dewatering; plants that use <100 gpm) | 1 | 4.8.1.1 4.8.1.2 | 4.5 |
| Groundwater-quality degradation (Ranney wells) | 1 | 4.8.2.2 | 4.5 |
| Groundwater-quality degradation (saltwater intrusion) | 1 | 4.8.2.1 | 4.5 |
| Groundwater-quality degradation (cooling ponds in salt marshes) | 1 | 4.8.3 | 4.5 |
| TERRESTRIAL RESOURCES | | | |
| Cooling tower impacts on crops and ornamental vegetation | 1 | 4.3.4 | 4.1 |
| Cooling tower impacts on native plants | 1 | 4.3.5.1 | 4.1 |
| Bird collisions with cooling towers | 1 | 4.3.5.2 | 4.1 |
| Cooling pond impacts on terrestrial resources | 1 | 4.4.4 | 4.1 |
| Power line right-of-way management (cutting and herbicide application) | 1 | 4.5.6.1 | 4.2 |
| Bird collisions with power lines | 1 | 4.5.6.2 | 4.2 |
| Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock) | 1 | 4.5.6.3 | 4.2 |
| Floodplains and wetland on power line right-of-way | 1 | 4.5.7 | 4.2 |
| AIR QUALITY | | | |
| Air-quality effects of transmission lines | 1 | 4.5.2 | 4.2 |
| LAND USE | | | |
| Power line right-of-way | 1 | 4.5.3 | 4.2 |
| HUMAN HEALTH | | | |
| Microbiological organisms (occupational health) | 1 | 4.3.6 | 4.1 |
| Noise | 1 | 4.3.7 | 4.1 |

Table 4.0-1. (contd)

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 |
|---|-----------------|--|------------------------------------|
| Radiation exposures to public (license renewal term) | 1 | 4.6.2 | 4.3 |
| Occupational radiation exposures (license renewal term) | 1 | 4.6.3 | 4.3 |
| SOCIOECONOMICS | | | |
| Public services: public safety, social services, and tourism and recreation | 1 | 4.7.3 4.7.3.3 4.7.3.4 4.7.3.6 | 4.4 |
| Public services: education (license renewal term) | 1 | 4.7.3.1 | 4.4 |
| Aesthetic impacts (license renewal term) | 1 | 4.7.6 | 4.4 |
| Aesthetic impacts of transmission lines (license renewal term) | 1 | 4.5.8 | 4.2 |

Generic conclusions relative to impacts were reached for these issues that are appropriate for all plants, or for some issues for specific classes of plants. These conclusions were that (1) a single level of significance could be assigned to the impact and (2) plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. In the absence of new and significant information, these issues may be addressed in the SEIS without additional plant specific analysis.

Environmental issues related to operation during the renewal term considered in NUREG-1437 for which these conclusions could not be reached for all plants, or for specific classes of plants, are Category 2 issues. These issues are listed in Table 4.0-2.

A plant specific analysis is required for each applicable Category 2 issue and for environmental justice, which was not addressed in NUREG-1437.

Tables 4.0-1 and 4.0-2 may be modified and included in the introductory material to direct readers to the specific SEIS section that deals with each issue. It would be appropriate to create a single table that lists all of the issues that have been determined to be inapplicable to the applicant's plant and the reasons that the issues are inapplicable. The inapplicable issues could then be deleted from the lists of Category 1 and Category 2 issues so that these lists contain only the issues addressed in the SEIS.

Table 4.0-2. Category 2 Issues

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 Sections | 10 CFR 51.53(c)(3)(ii) subparagraph |
|---|-----------------|--------------------------------|---|--|
| SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS) | | | | |
| Water-use conflicts (plants with cooling ponds or cooling towers using makeup water from a small river with low flow) | 2 | 4.3.2.1 4.4.2.1 | 4.1.1 | A |
| AQUATIC ECOLOGY (FOR PLANTS WITH ONCE-THROUGH AND COOLING POND HEAT DISSIPATION SYSTEMS) | | | | |
| Entrainment of fish and shellfish in early life stages | 2 | 4.2.2.1.2 4.4.3 | 4.1.2 | B |
| Impingement of fish and shellfish | 2 | 4.2.2.1.3 4.4.3 | 4.1.3 | B |
| Heat shock | 2 | 4.2.2.1.4 4.4.3 | 4.1.4 | B |
| GROUNDWATER USE AND QUALITY | | | | |
| Groundwater-use conflicts (potable and service water, and dewatering; plants that use >100 gpm) | 2 | 4.8.1.1 4.8.1.2 | 4.5.1 | C; |
| Groundwater-use conflicts (plants using cooling towers withdrawing makeup water from a small river) | 2 | 4.8.1.3 | 4.5.2 | A |
| Groundwater-use conflicts (Ranney wells) | 2 | 4.8.1.4 | 4.5.3 | C |
| Groundwater-quality degradation (cooling ponds at inland sites) | 2 | 4.8.3 | 4.5.4 | D |
| THREATENED OR ENDANGERED SPECIES (FOR ALL PLANTS) | | | | |
| Threatened or endangered species | 2 | 4.1 | 4.6.1 | E |

Table 4.0-2. (contd)

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 Sections | 10 CFR 51.53(c)(3)(ii) subparagraph |
|---|-----------------|----------------------------|---|--|
| HUMAN HEALTH | | | | |
| Microbiological organisms (public health) (plants using lakes or canals or cooling towers or cooling ponds that discharge to a small river) | 2 | 4.3.6 | 4.1.5 | G |
| Electromagnetic fields, acute effects (electric shock) | 2 | 4.5.4.1 | 4.2.1 | H |
| Electromagnetic fields, chronic effects | NA | 4.5.4.2 | 4.2.2 | |
| SOCIOECONOMICS | | | | |
| Housing impacts | 2 | 4.7.1 | 4.4.1 | I |
| Public services: public utilities | 2 | 4.7.3.5 | 4.4.2 | I |
| Offsite land use (license renewal term) | 2 | 4.7.4 | 4.4.3 | I |
| Public services, transportation | 2 | 4.7.3.2 | 4.4.4 | J |
| Historic and archaeological resources | 2 | 4.7.7 | 4.4.5 | K |
| ENVIRONMENTAL JUSTICE | | | | |
| Environmental Justice | NA | Not addressed | 4.4.6 | |

If there are environmental issues related to operation during the renewal term for which new and significant information has been identified by the applicant, by the public, or by the staff in independent review, the reviewer for this ESRP should prepare a table similar to the tables above that directs readers to the SEIS sections dealing with those issues.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/S1s 4.1 through 4.7. The paragraph(s) should list the types of information to be presented and describe their relationships to information presented earlier and to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCE

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.1 COOLING SYSTEM

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of cooling system impacts during the license renewal (LR) term. The potential cooling-system impacts during the LR term were evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the discussion of potential cooling-system impacts during the LR term in NUREG-1437, (2) identification and evaluation of new information related to potential cooling-system impacts during the license-renewal term for significance, (3) preparation of input to the supplemental environmental impact statement (SEIS) that disposes the Category 1 issues related to cooling-system operation during the renewal term, and (4) preparation of input to the SEIS that introduces the SEIS sections covering the Category 2 issues.

Potential impacts of cooling system operation during the renewal term related to

- water use (conflicts for systems using cooling ponds and towers)
- entrainment of fish and shellfish in early life stages
- impingement of fish and shellfish
- heat shock
- microbiological organisms (public health)

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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are identified as Category 2 issues in NUREG-1437 and Table B-1 of Appendix B, Subpart A to 10 CFR 51. The plant specific reviews of these issues required by 10 CFR 51.53(c)(3)(ii)(A), 10 CFR 51.53(c)(3)(ii)(B), and 10 CFR 51.53(c)(3)(ii)(G) are addressed specifically in ESRP/S1s 4.1.1 through 4.1.5.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 4.1.1 through 4.1.5. Obtain lists of cooling system issues for which there is significant new information.
- ESRP/S1 4.7. Provide a list of Category 1 cooling system issues for which there is significant new information.
- ESRP/S1 4.8. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the environmental report [ER])
- any new information included in the ER on the cooling system issues known to the applicant
- new and potentially significant information on cooling system issues identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of cooling system issues are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS

- 10 CFR 51.71(d) with respect to (1) compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies, including applicable zoning and land-use regulations, and (2) analysis of Category 2 issues
- 10 CFR 51.95(c)(4) with respect to SEIS contents and consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential environmental impacts of the cooling system is discussed in the following paragraph.

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2 information developed for those open Category 2 issues applicable to the plant, and any significant new information. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to cooling system impacts during the LR term, as appropriate, and addresses significant new information, if any.

III. REVIEW PROCEDURES

The review of potential cooling system impacts during the LR term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

(1) Review the discussion of cooling system issues in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The Category 1 potential cooling system issues identified in NUREG-1437 are listed in the following table.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--|
| SURFACE-WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS) | | |
| Altered current patterns at intake and discharge structures | 1 | 4.2.1.2.1 4.3.2.2 4.4.2 |
| Altered salinity gradients | 1 | 4.2.1.2.2 4.2.2 |
| Altered thermal stratification of lakes | 1 | 4.2.1.2.3 4.4.2.2 |
| Temperature effects on sediment-transport capacity | 1 | 4.2.1.2.3 4.4.2.2. |
| Scouring caused by discharged cooling water | 1 | 4.2.1.2.3 4.4.2.2 |
| Eutrophication | 1 | 4.2.1.2.3 4.4.2.2 |
| Discharge of chlorine or other biocides | 1 | 4.2.1.2.4 4.4.2.2 |
| Discharge of sanitary wastes and minor chemical spills | 1 | 4.2.1.2.4 4.4.2.2 |
| Discharge of other metals in waste water | 1 | 4.2.1.2.4 4.3.2.2 4.4.2.2 |
| Water-use conflicts (plants with once-through cooling systems) | 1 | 4.2.1.3 |
| AQUATIC ECOLOGY (FOR ALL PLANTS) | | |
| Accumulation of contaminants in sediments or biota | 1 | 4.2.1.2.4 4.3.3 4.4.3 4.4.2.2 |

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|--|-----------------|--------------------------------|
| Entrainment of phytoplankton and zooplankton | 1 | 4.2.2.1.1 4.3.3 4.4.3 |
| Cold shock | 1 | 4.2.2.1.5 4.3.3 4.4.3 |
| Thermal plume barrier to migrating fish | 1 | 4.2.2.1.6 4.4.3 |
| Distribution of aquatic organisms | 1 | 4.2.2.1.6 4.4.3 |
| Premature emergence of aquatic insects | 1 | 4.2.2.1.7 4.4.3 |
| Gas supersaturation (gas bubble disease) | 1 | 4.2.2.1.8 4.4.3 |
| Low dissolved oxygen in the discharge | 1 | 4.2.2.1.9 4.3.3 4.4.3 |
| Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses | 1 | 4.2.2.1.10 4.4.3 |
| Stimulation of nuisance organisms | 1 | 4.2.2.1.11 4.4.3 |
| AQUATIC ECOLOGY (FOR PLANTS WITH COOLING TOWER BASED HEAT-DISSIPATION SYSTEMS) | | |
| Entrainment of fish and shellfish in early life stages | 1 | 4.3.3 |
| Impingement of fish and shellfish | 1 | 4.3.3 |
| Heat shock | 1 | 4.3.3 |
| TERRESTRIAL RESOURCES | | |
| Cooling tower impacts on crops and ornamental vegetation | 1 | 4.3.4 |
| Cooling tower impacts on native plants | 1 | 4.3.5.1 |

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--------------------------------|
| Bird collisions with cooling towers | 1 | 4.3.5.2 |
| Cooling pond impacts on terrestrial resources | 1 | 4.4.4 |
| HUMAN HEALTH | | |
| Microbiological organisms (occupational health) | 1 | 4.3.6 |
| Noise | 1 | 4.3.7 |

(2) Determine if there is new information that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- land-use, water-use or air-quality regulations affecting cooling systems. Have there been changes in regulations of governmental agencies that affect cooling systems since the plant was constructed? If so, do the changes affect NRC's evaluation of the license-renewal application?

If the search conducted in this step reveals new information, continue with Step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is no new information, and adopting the conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437.

(4) Prepare a concise statement(s) of the issues raised by significant new information and provide these statements to the EPM for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of Section 4.7 of the SEIS.

- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in SEIS Section 4.7 for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be determined by the analysis required to reach a conclusion related to potential cooling system impacts during the LR term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each category 1 issue:

Altered current patterns at intake and discharge structures: Based on information in the GEIS, the Commission found that

“Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of the _____ performed for the _____. Therefore, the staff concludes that there are no impacts of altered current patterns during the renewal term beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Altered current patterns at intake and discharge structures: Based on information in the GEIS, the Commission found that

“Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including

(a) Include this phrase only in the final SEIS.

(a) Include this phrase only in the final SEIS.

reports of studies of the _____ performed for the _____. The following new information related to altered current patterns has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of altered current patterns during the renewal term beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Altered current patterns at intake and discharge structures: Based on information in the GEIS, the Commission found that

“Altered current patterns have not been found to be a problem at operating nuclear power plants and are not expected to be a problem during the license renewal term.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to altered current patterns has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.]

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of altered current patterns during the renewal term beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission’s regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

(b) Include this phrase only in the final SEIS.

VI. REFERENCES

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Supplement to final environmental impact statement.”

10 CFR 51 Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits, Standard Design Certifications, and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.1.1 WATER-USE CONFLICTS (COOLING PONDS AND COOLING TOWERS)

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the potential impacts of water-use conflicts resulting from makeup water for cooling tower or cooling pond operation being withdrawn from adjacent water bodies during critical low-flow conditions. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant is required by 10 CFR 51.53(c)(3)(ii)(A) to address the issue in its environmental report (ER) if the plant employs cooling towers or cooling ponds.

The scope of the review directed by this plan includes (1) review of the discussion of the issue in NUREG-1437, (2) evaluation of the data and analysis in the applicant's ER, (3) independent analysis and evaluation of the data, if appropriate, and (4) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.2.1. Obtain a description of the plant location and location of nearby water bodies.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.2.3. Obtain descriptions of cooling-tower and cooling-pond seasonal makeup water requirements.
- ESRP/S1 2.3.5. Obtain descriptions of aquatic ecosystems and their respective seasonal water needs.
- ESRP/S1 2.3.6. Obtain descriptions of terrestrial ecosystems and their respective seasonal water needs.
- ESRP/S1 4.1. Provide significant new information related to water use, if appropriate.
- ESRP/S1 4.8. Provide a summary of the analysis performed and conclusion reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- descriptions of the site and vicinity water bodies and groundwater aquifers (from ESRP/S1 2.2.1)
- descriptions of the spatial and seasonal hydrological alterations to the local environment resulting from operation of cooling ponds or cooling towers (from ER and ESRP/S1 2.3.2)
- descriptions of aquatic and terrestrial ecosystems potentially impacted by alterations in the spatial and temporal distribution of water (from ESRP/S1s 2.3.5 and 2.3.6)
- descriptions of any currently employed or proposed practices and measures to control or limit operational water-use impacts (from the ER)
- summary of statutory and other legal restrictions relating to water use or specific water-body restrictions on water use imposed by State or Federal regulations (from the ER and ESRP 2.3.2)
- Federal, State, regional, local, and affected Native American tribal agencies' standards and regulations applicable to water quality and water use (from consultation with Federal, State, regional, local, and affected Native American tribal agencies); determine if there are any State policies regarding hydraulic continuity
- descriptions of proposed means to ensure operational compliance with water-quality and water-use standards and regulations (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of water-use impacts at the plant's site are based on the relevant requirements of the following regulations:

- 40 CFR 6, Appendix A, with respect to procedures on floodplain and wetlands protection
- 40 CFR 149 with respect to possible supplemental restrictions on water use in or above a sole source aquifer
- Federal, State, regional, local, and affected Native American tribal agencies' water laws and water rights
- 10 CFR 51 Subpart A, Appendix B, Table B-1, with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) provides guidance on preparation of ERs associated with LR.
- In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the U.S. Supreme Court granted the States additional authority to limit hydrological alterations beyond the States' role in regulating water rights. As a result of this ruling, the States may regulate the quantity of water as a part of the definition of water quality.

Technical Rationale

The technical rationale for evaluating the applicant's potential water-use impacts is discussed in the following paragraph:

According to the analysis in NUREG-1437, water-use impacts associated with makeup water for cooling towers or cooling ponds are generally expected to be SMALL or MODERATE. However, the SEIS should include an analysis that considers the environmental effects of water use as a result

of cooling towers or cooling ponds. Following the acceptance criteria listed above will help ensure that the proposed water-use impacts are considered with respect to matters covered by such standards and requirements.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of cooling-tower or cooling-pond makeup water withdrawals on local aquatic and terrestrial ecosystems.

- (1) Review the discussion of potential for water-use conflicts due to impacts on instream and riparian communities near plants that use makeup water from sources with relatively low flow for at least part of the year in the NUREG-1437.
- (2) Determine if the water needs of the affected aquatic and terrestrial ecosystems will not be met as a result of water used for makeup by the cooling towers and cooling ponds or as a result of the natural climate induced variability in water demands for both the ecosystems and makeup water. Comparing the seasonal water demands by both the plant and the ecosystems with the seasonal variability in inflows will identify those seasons, if any, when water conflicts may likely occur. Extreme low-inflow conditions should be compared with extreme high-demand levels. If adequate water supply is not available for all seasons under extreme conditions, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS describing the water use in the region that concludes that there are NO impacts resulting from cooling towers or cooling ponds.
- (3) In many locations, aquatic and terrestrial ecosystems are stressed due to limited availability of water during specific seasons. Further reductions in water availability, as a result of water being diverted for makeup water for cooling towers and cooling ponds, will further stress the affected ecosystems. The significance of the makeup water is related to the frequency and severity of these stressed conditions. If the frequency and severity of the ecosystem's water deficit may be insignificantly increased by the additional deficit caused by diversions for makeup water, then continue the analysis at Step (4). Otherwise, prepare a statement for the SEIS describing the water-use conflicts in the region that concludes that there are SMALL impacts resulting from makeup water diversions.
- (4) If the frequency and severity of the ecosystem's water deficit is significantly impacted by diversions for makeup water, prepare a statement for the SEIS describing the water-use conflicts in the region that concludes that there are SMALL or MODERATE impacts resulting from makeup-water diversions, based on the significance of the affected ecosystem. If the impacts are MODERATE, evaluate potential mitigation measures.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of makeup water for cooling towers and cooling ponds. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

The applicant has stated that the diversion of makeup water required for the plant's _____ (cooling towers or cooling ponds) does not change the frequency or severity of water-stressed conditions in ecosystems that share the same source of water. The staff did not find any information to the contrary. Therefore, the staff concludes that makeup water diversions will have NO impact on the nearby aquatic and terrestrial ecosystems.

The applicant has stated that the diversion of makeup water required for the plant's cooling towers or cooling ponds does not significantly increase the frequency or severity of water stressed conditions in ecosystems that share the same source of water. The staff did not find any information to the contrary. Therefore, the staff concludes that makeup water diversions will have a SMALL impact on the nearby aquatic and terrestrial ecosystems.

The applicant has stated that the diversion of makeup water required for the plant's cooling towers or cooling ponds significantly increases the frequency or severity of water stressed conditions in ecosystems that share the same source of water. The applicant has committed to mitigating any impacts to the aquatic and terrestrial ecosystems by _____. (For example, by providing off-stream storage during critical low-flow seasons to ensure instream flow targets are met during plant operation.) Therefore, the staff concludes that makeup water diversions will have a (SMALL or MODERATE) impact on the nearby aquatic and terrestrial ecosystems.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR 6, Appendix A, “Statement of Procedures on Floodplain Management and Wetlands Protection.”

40 CFR 149, “Sole Source Aquifers.”

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL STANDARD
 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

4.1.2 ENTRAINMENT OF FISH AND SHELLFISH IN EARLY LIFE STAGES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of ongoing and potential plant intake system impacts on the entrainment of fish and shellfish in early life stages. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(B) to address the issue in its environmental report (ER) if the plant employs either a once-through or closed-cycle cooling pond heat-dissipation system.

The scope of the review directed by this plan should include (1) an analysis of the effects of entrainment in sufficient detail to allow the reviewer to predict ongoing and potential impacts on "important" species (as defined in ESRP/S1, Table 2.2.5), (2) an evaluation of the significance of such impacts, and (3) the preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.1.1. Obtain information about the power plant's external appearance and layout in enough detail to support the analyses made in ESRP/S1 4.1.2.

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4.1.2-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.3. Obtain a description of the cooling system and its operational modes in enough detail to support the analyses made in ESRP/S1 4.1.2.

- ESRP/S1 2.2.5. Obtain a description of the aquatic ecology in the vicinity of the site, especially those resources potentially affected by the cooling water intake system.
- ESRP/S1 4.6.1. Provide information related to potential impacts of the cooling system intake on threatened or endangered species not previously addressed, if appropriate.
- ESRP/S1 4.8. Provide a summary statement describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors and whether refurbishment is part of the LR application. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a copy of the plant's current National Pollutant Discharge Elimination System (NPDES) permit and a 316(b) demonstration acceptable to the EPA or State permitting agency at the time of the application for LR
- a description of any proposed changes to the plant-cooling-system intake.

If the preceding documentation is provided, the data and information needs are fulfilled. If the documentation cannot be provided, or the documentation does not reflect the proposed conditions during the renewal term, then the reviewer for this ESRP should obtain all of the following information:

- susceptibility of "important" fish and shellfish species to entrainment (from the ER and the general literature)
- the economic value of the species for local or regional commercial and recreational fisheries. For species that are commercially or recreationally valuable, estimates of natural survival rates up to those life stages at which the species are recruited to the harvestable or parent stocks (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- for those "important" fish and shellfish species potentially affected by plant operation, estimates of the regional standing stocks (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- transit time from the intake structure to the point of discharge to a receiving water body (from the ER)

In addition to the specific site and vicinity information listed here, additional background information is needed to review the impacts of entrainment of fish and shellfish in early life stages from operation of the cooling intake system. This background information should be found in the ER and includes "important" species as well as the hydrological and ecological conditions on and in the vicinity of the site. The reviewer for this ESRP should obtain additional information about the plant design and operating

procedures from other ER sections describing components of the cooling system and the hydrodynamics and physical impacts of the intake.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of impacts of entrainment of fish and shellfish in early life stages are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 with respect to ERs and the analysis of potential impacts contained therein
- 10 CFR 51.53(c)(3)(ii)(B) with respect to submission of Federal Water Pollution Control Act (FWPCA), commonly referred to as the Clean Water Act (CWA) determinations and 316(a) variances or equivalent State permits and supporting documentation
- 40 CFR 122 with respect to NPDES permit conditions specified in the CWA
- Coastal Zone Management Act of 1972 with respect to natural resources and land or water use of the coastal zone
- Endangered Species Act of 1973, as amended, with respect to identifying threatened and endangered species, critical habitats, and initiating formal or informal consultation with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service or both
- CWA (as amended) with respect to restoration and maintenance of the chemical, physical, and biological integrity of water resources
- Fish and Wildlife Coordination Act of 1958 with respect to consideration of fish and wildlife resources in the planning of development projects that affect water resources.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to plant-specific evaluation of the entrainment of juvenile fish and shellfish for plants with once-through or closed-cycle cooling pond heat-dissipation systems.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b) provides guidance to staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a) provides guidance on the analysis of potential impacts of operation of the cooling-water intake system. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during station operation.
- Regulatory Guide 4.7, Rev. 2, *General Site Suitability for Nuclear Power Stations* (NRC 1998) contains guidance concerning the ecological systems and biota at potential sites and requires that

their environs be sufficiently well known to allow reasonably certain predictions of impacts. It also requires that there are no unacceptable or unnecessary deleterious impacts on populations of “important” species or on ecological systems from the construction or operation of a nuclear power station. This guide provides regulatory positions concerning entrainment, impingement, or other forms of entrapment and effects of cooling systems on aquatic species’ migration routes.

- Compliance with environmental quality standards and requirements of the CWA is not a substitute for and does not negate the requirement for NRC to weigh the environmental impacts of the proposed action and to consider mitigation measures and alternatives to reduce adverse impacts. If the applicant provides a current NPDES permit, CWA 316(b) determination, or State permits and supporting documentation acceptable to the EPA at the time of license-renewal application, the NRC will consider them in its determination of the magnitude of the environmental impacts. When such assessments of impacts of entrainment of fish and shellfish in early life stages are not provided by the applicant, the NRC (possibly in conjunction with the permitting authority and other agencies having relevant expertise) will conduct its own assessment.

Technical Rationale

The technical rationale for evaluating the applicant’s plant cooling water intake system impacts on the entrainment of fish and shellfish at early life stages is discussed in the following paragraph:

The SEIS should include an analysis that considers the environmental effects of the cooling water intake system and the alternatives available for reducing or avoiding adverse environmental effects, as well as any environmental benefits that may result from the proposed action. Following the acceptance criteria listed above will help ensure that the impacts of the proposed cooling-water intake system on fish and shellfish are considered with respect to matters covered by such standards and requirements.

III. REVIEW PROCEDURES

The impacts from cooling water intake are regulated through the NPDES permit system. The CWA requires that the location, design, construction, and capacity of the cooling water intake structure reflect the best technology available for minimizing environmental impacts. Responsibility for making this determination rests with the EPA or with its designees.

The reviewer may refer to earlier NRC environmental reviews in which evaluation of intake system operational impacts has been important. The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of entrainment of fish and shellfish in early life stages. Suggested steps for the review process are as follows:

- (1) Determine whether the applicant has provided a current NPDES permit with a 316(b) determination, if appropriate, or equivalent State permits and supporting documentation. If these documents are not available, not current, or do not reflect conditions during the LR term, continue the analysis at Step (2). Otherwise, prepare a statement for the SEIS describing the potential for entrainment of fish and shellfish in early life stages that

- summarizes the permitting documents that have been reviewed
 - states that a current NPDES permit and 316(b) determination are available and current
 - concludes that there are no significant cooling water intake system impacts of entrainment on fish and shellfish in early life stages.
- (2) Identify fish and shellfish species present in the vicinity of the plant that are susceptible to entrainment. Estimate the levels of susceptibility in either qualitative or quantitative terms, or both. Methods for quantifying entrainment susceptibilities are available; however, they are generally applicable to specific habitat/species/station characteristics. Ensure that the assumptions made in model developments are valid for the case under review.

If fish and shellfish species are present and are susceptible to entrainment such that effects will be detectable or may destabilize or noticeably alter fish or shellfish population levels, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS describing the potential for entrainment of fish and shellfish in early life stages that

- summarizes the permitting information, species data, and methods for quantifying fish and shellfish entrainment that have been reviewed
 - states that there are no populations of fish or shellfish species present in the vicinity of the site that will be entrained in the cooling water intake system to the point where changes in their population levels are detectable
 - concludes that, because fish and shellfish populations will remain stable even if some are entrained, the cooling water intake system impacts of entrainment on fish and shellfish in early life stages are SMALL within the context of the analysis in NUREG-1437.
- (3) After identifying pertinent fish and shellfish species and determining their susceptibility, estimate the survival rates for those species entrained by relying on experience at this and other comparable stations. Certain species have been shown to be especially fragile (e.g., threadfin shad, menhaden, bay anchovy), whereas some shellfish are much hardier (e.g., blue crab and penaeid shrimp).
- (4) Consider the design and operation of any screen wash and fish return system, either in operation or proposed. Consider the potential value of such a system if a return system is not operational or proposed. Determine the percent mortality of entrained fish and shellfish by considering the following:
- once-through systems – The reviewer may perform an analysis using a refined estimate of mortality and factoring in species tolerances to thermal, chemical, mechanical, and pressure stresses; transit time through the system; and plant operational characteristics.
 - multipurpose cooling pond for which makeup water is provided from another water body (The impacts should be considered at both the plant intake and the source water intake.)

- (5) Consider the potential for altered hydrodynamic characteristics induced by inlet system operation (e.g., altered circulation patterns) to affect attraction and entrainment of aquatic biota and determine the extent and seasonal variation of any such alterations.
- (6) Determine if there is any potential for the recirculation of heated effluent from the plant discharge system. If recirculation is predicted, analyze the potential effects of increased impacts of entrainment. Estimate the magnitude of the potential entrainment impacts on the species populations and the aquatic ecosystem.
- (7) Consider the potential station cropping rates for juvenile stages of fish and shellfish species. Consider these cropping rates in relation to natural mortality rates, reproductive rates, and standing stock estimates for the species' populations. Consider other existing stresses (cumulative mortality) to the entrainable species (e.g., impacts of other nearby electrical generating stations).

The reviewer may assume, as a first approximation, that plant cropping translates directly to a reduction in the harvestable or parent stocks. Where possible, this impact should be expressed in quantitative units such as (1) catch per unit effort, (2) harvestable stock by weight, (3) recruitment in numbers, (4) dollar values, and (5) numbers or percentages of specific size, age group, or life stage. The reviewer may use more refined analyses (e.g., population modeling, compensation factors) when results suggest that additional precision is needed.

- (8) Identify and evaluate potential mitigation measures and alternatives.
- (9) Prepare a statement for the SEIS describing the potential for entrainment of fish and shellfish in early life stages that
 - summarizes the relevant information, including species data, and methods for quantifying fish and shellfish entrainment that have been reviewed
 - lists the species present in the vicinity of the site that may be entrained in the cooling-water intake system to the point where changes in their population levels are detectable
 - summarizes when particular biota may be most affected
 - summarizes any increased potentials for entrainment due to recirculation of heated effluent
 - estimates the magnitude of the potential entrainment impacts on the species populations and the aquatic ecosystem
 - identifies and describes potential mitigation measures and alternatives
 - concludes that the cooling-water intake system impacts of entrainment on fish and shellfish in early life stages are SMALL, MODERATE, or LARGE within the context of the analysis in NUREG-1437.

IV. EVALUATION FINDINGS

The depth and extent of input to the SEIS will be governed by the attributes of the juvenile fish and shellfish resources that could be affected by operation of the station's cooling water intake systems, and by the magnitude of the expected impacts on these resources. This section of the SEIS should present (1) a list of adverse impacts of cooling-system intake operation to fish and shellfish in early life stages, (2) a list of the impacts for which there are measures or controls to limit adverse impacts and the associated measures and controls, (3) the applicant's commitments to limit these impacts, and (4) the staff's evaluation of the adequacy of the applicant's measures and controls to limit adverse impacts. This information should be summarized for the reviewer of ESRP/S1 4.8.

Statements written for the EIS are described in the previous section and should be included as appropriate for background to the staff's findings. This section may include a summary of staff consultations with the appropriate NPDES administrative agencies having responsibilities under the FWPCA. Any studies or environmental investigations performed by these agencies that address intake system entrainment impacts to fish and shellfish in early life stages should be described or referenced.

If any threatened or endangered species not previously addressed under licensing could be potentially affected by the operation of the cooling-water intake system, an informal consultation with the appropriate Federal agency (U.S. Fish and Wildlife Service or National Marine Fisheries Service) must be arranged as specified in ESRP/S1 3.8.1 and 4.6.1. The SEIS should contain a summary of the results of such consultations if they occur.

If the reviewer verifies that sufficient information has been provided in accordance with the guidance provided by this ESRP, then the evaluation will support one of the following concluding statements, to be included in the SEIS:

The staff has reviewed the available information relative to potential impacts of the cooling water intake system on the site's entrainment of fish and shellfish in early life stages. Based on this review, the staff concludes that the potential impacts are SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to potential impacts of the cooling water intake system on the entrainment of fish and shellfish in early life stages, including mitigation measures and alternatives. Based on this review, the staff concludes that the potential impacts are (MODERATE or LARGE). Potential mitigation measures have been identified and evaluated.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51, Subpart A, Appendix B, “Environmental effect of renewing the operating license of a nuclear power plant.”

10 CFR 51.45, “Environmental report.”

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR 122, “EPA Administered Permit Programs: The NPDES Pollution Elimination Systems.”

Coastal Zone Management Act, as amended, 16 USC 1451 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 4.7, Rev. 2. 1998. *General Site Suitability for Nuclear Power Stations*.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
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 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

4.1.3 IMPINGEMENT OF FISH AND SHELLFISH

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of ongoing and potential plant intake system impacts on the impingement of fish and shellfish. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(B) to address the issue in its environmental report (ER) if the plant employs a once-through cooling system or cooling pond heat dissipation system.

The scope of the review directed by this plan includes (1) an analysis of the effects of impingement in sufficient detail to allow the reviewer to predict ongoing and potential impacts to "important" fish and shellfish species (as defined in ESRP/S1, Table 2.2.5), (2) an evaluation of the significance of such impacts, and (3) the preparation of input to a supplemental environmental impact statement (SEIS). The review should be extended to consider the effects of altered circulation patterns and re-entrainment of heated effluents if these effects are determined to be significant.

Review Interfaces

October 1999

4.1.3-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.1. Obtain information about the power plant's external appearance and layout in enough detail to support the analyses made in ESRP/S1 4.1.3.
- ESRP/S1 2.1.3. Obtain a description of the cooling system and its operational modes in enough detail to support the analyses made in ESRP/S1 4.1.3. This should include information regarding physical impacts caused by the flow field induced by the intake system.
- ESRP/S1 2.2.5. Obtain a description of the aquatic ecology in the vicinity of the site, especially those resources potentially affected by the cooling water intake system.
- ESRP/S1 4.6.1. Provide information related to potential impacts of the cooling system intake on threatened or endangered species not previously addressed, if appropriate.
- ESRP/S1 4.8. Provide a summary statement describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a copy of the plant's current National Pollutant Discharge Elimination System (NPDES) permit and a 316(b) demonstration acceptable to the EPA or state permitting agency at the time of the application for LR
- a description of any proposed changes to the plant cooling system intake.

If the preceding documentation is obtained, the data and information needs are fulfilled. If the documentation cannot be provided, or the document does not reflect the proposed conditions during the renewal term, then the reviewer for this ESRP should obtain all of the following information:

- susceptibility of "important" fish and shellfish species to impingement, and estimates of life-stage-specific mortality rates of impinged fish and shellfish (from the ER and the general literature)
- the economic value of the species for local or regional commercial and recreational fisheries. For species that are commercially or recreationally valuable, estimates of natural survival rates up to those life stages at which the species are recruited to the harvestable or parent stocks (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)

- for those “important” fish and shellfish species potentially affected by plant operation, estimates of the regional standing stocks (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies).

In addition to the specific site and vicinity information listed here, additional background information is needed to review the impacts of impingement of fish and shellfish from operation of the cooling intake system. This background information should be found in the ER and includes “important” species as well as the hydrological and ecological conditions on and in the vicinity of the site. The reviewer for this ESRP should obtain additional information about the plant design and operating procedures from other ER sections describing components of the cooling system and the hydrodynamics and physical impacts of the intake.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of impacts of impingement of fish and shellfish by the plant cooling-system intake are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 with respect to ERs and the analysis of potential impacts contained therein
- 10 CFR 51.53(c)(3)(ii)(B) with respect to submission of Federal Water Pollution Control Act (FWPCA), commonly referred to as the Clean Water Act (CWA) 316(b) determinations and 316(a) variances or equivalent State permits and supporting documentation
- 40 CFR 122 with respect to NPDES permit conditions specified in the CWA
- Coastal Zone Management Act of 1972 with respect to natural resources and land or water use of the coastal zone
- Endangered Species Act of 1973, as amended, with respect to identifying threatened and endangered species, critical habitats, and initiating formal or informal consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- CWA (as amended) with respect to restoration and maintenance of the chemical, physical, and biological integrity of water resources
- Fish and Wildlife Coordination Act of 1958 with respect to consideration of fish and wildlife resources in the planning of development projects that affect water resources.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to plant specific evaluation of the impingement of juvenile fish and shellfish for plants with once-through or closed-cycle cooling pond heat dissipation systems.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1996a), provides guidance to staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on the analysis of potential impacts of operation of the cooling-water intake system. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during station operation.
- Compliance with environmental quality standards and requirements of the CWA is not a substitute for and does not negate the requirement for NRC to weigh the environmental impacts of the proposed action and to consider mitigation measures and alternatives to reduce adverse impacts. If the applicant provides a current NPDES permit, 316(b) determination, or State permits and supporting documentation acceptable to the EPA at the time of license-renewal application, the NRC will consider them in its determination of the magnitude of the environmental impacts. When such assessments of impacts of impingement of fish and shellfish are not provided by the applicant, the NRC (possibly in conjunction with the permitting authority and other agencies having relevant expertise) will conduct its own assessment.

Technical Rationale

The technical rationale for evaluating the applicant's cooling water intake system impacts on the impingement of fish and shellfish is discussed in the following paragraph:

The SEIS should include an analysis that considers the environmental effects of the cooling water intake system and the alternatives available for reducing or avoiding adverse environmental effects, as well as any environmental benefits that may result from the proposed action. Following the acceptance criteria listed above will help ensure that the environmental impacts of the proposed cooling water intake system are considered with respect to matters covered by such standards and requirements.

III. REVIEW PROCEDURES

The impacts from cooling water intake are regulated through the NPDES permit system. The CWA requires that the location, design, construction, and capacity of the cooling water intake structure reflect the best technology available for minimizing environmental impacts. Responsibility for making this determination rests with the EPA or with its designees.

The reviewer may refer to earlier NRC environmental reviews in which evaluation of intake system operational impacts has been important. The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of impingement of fish and shellfish. Suggested steps for the review are as follows:

- (1) Determine whether the applicant has provided a current NPDES permit with a 316(b) determination, if appropriate, or equivalent State permits and supporting documentation. If these documents are not available, are not current, or do not reflect conditions during the license renewal term, continue the analysis at Step (2). Otherwise, prepare a statement for the SEIS describing the potential for impingement of fish and shellfish that
 - summarizes the permitting documents that have been reviewed
 - states that a current NPDES permit and 316(b) determination are available and current
 - concludes that there are no significant cooling water intake system impacts of impingement on fish and shellfish.
- (2) Identify fish and shellfish species present in the vicinity of the plant that are susceptible to impingement. Estimate the levels of susceptibility in either qualitative or quantitative terms, or both. Methods for quantifying impingement susceptibilities are not well developed; therefore, it may be necessary to draw on past experience of impingement at the plant (or the experience of comparable power stations) to predict whether the potential is HIGH, MEDIUM, or LOW for the plant.

Ensure that assumptions made in available model developments are valid for the case under review.

If fish and shellfish species are present and are susceptible to impingement such that effects will be detectable or may destabilize or noticeably alter fish or shellfish population levels, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS describing the potential for impingement of fish and shellfish that

- summarizes the permitting information, species data, and methods for quantifying fish and shellfish impingement that have been reviewed
- states that there are no populations of fish or shellfish species present in the vicinity of the site that will be impinged on the cooling water intake debris screens to the point where changes in their population levels are detectable
- concludes that, because fish and shellfish populations will remain stable even if some are impinged, the cooling water intake system impacts of impingement on fish and shellfish are SMALL within the context of the analysis in NUREG-1437.

- (3) After identifying pertinent fish and shellfish species and determining their susceptibility, estimate the life stage specific survival rates for those species impinged by relying on experience at this and other comparable stations. Keep in mind that certain species have been shown to be especially fragile (e.g., threadfin shad, menhaden, bay anchovy), whereas some shellfish are much hardier (e.g., blue crab and penaeid shrimp).
- (4) Consider the design and operation of any screen-wash system, either in operation or proposed.
- (5) Consider the potential for altered hydrodynamic characteristics induced by inlet system operation (e.g., altered circulation patterns) to affect attraction and impingement of aquatic biota and determine the extent and seasonal variation of any such alterations.
- (6) Determine if there is any potential for the recirculation of heated effluent from the plant discharge system. If recirculation is predicted, analyze the potential effects of increased impacts of impingement. Estimate the magnitude of the potential impingement impacts on the species populations and the aquatic ecosystem.
- (7) Consider the potential station cropping rates for fish and shellfish species. The reviewer may assume, as a first approximation, that plant cropping translates directly to a reduction in the harvestable or parent stocks. Where possible, this impact should be expressed in quantitative units such as (1) catch per unit effort, (2) harvestable stock by weight, (3) recruitment in numbers, (4) dollar values, and (5) numbers or percentages of specific size, age group, or life stage. The reviewer may use more refined analyses (e.g., population modeling, compensation factors) when results suggest that additional precision is needed.
- (8) Consider these cropping rates in relation to natural mortality rates, reproductive rates, and standing-stock estimates for the species' populations.

Consider other existing stresses (cumulative mortality) to the impingable species (e.g., impacts of other electrical generating stations sited nearby).

- (9) Identify and evaluate potential mitigation measures and alternatives.
- (10) Prepare a statement for the SEIS describing the potential for impingement of fish and shellfish in early life stages that
 - lists the species present in the vicinity of the site that may be impinged on the cooling water intake debris screens to the point where changes in their population levels are detectable
 - summarizes when particular biota may be most affected
 - summarizes any increased potentials for impingement due to recirculation of heated effluent

- estimates the magnitude of the potential impingement impacts on the species populations and the aquatic ecosystem
- summarizes the relevant information, including species data, and methods for quantifying fish and shellfish impingement that have been reviewed
- identifies and describes potential mitigation measures and alternatives
- concludes that the cooling-water intake-system impacts of impingement on fish and shellfish are SMALL, MODERATE, or LARGE within the context of the analysis in NUREG-1437.

IV. EVALUATION FINDINGS

The depth and extent of input to the SEIS will be governed by the attributes of the fish and shellfish resources that could be affected by operation of the station's cooling water intake systems and by the magnitude of the expected impacts on these resources. This section of the SEIS should present (1) a list of adverse impacts of cooling-system intake operation to fish and shellfish, (2) a list of the impacts for which there are measures or controls to limit adverse impacts and the associated measures and controls, (3) the applicant's commitments to limit these impacts, and (4) the staff's evaluation of the adequacy of the applicant's measures and controls to limit adverse impacts. This information should be summarized for the reviewer of ESRP/S1 4.8.

Statements written for the EIS are described in the previous section and should be included as appropriate for background to the staff's findings. This section may include a summary of staff consultations with the appropriate NPDES administrative agencies having responsibilities under the FWPCA. Any studies or environmental investigations performed by these agencies that address intake system impingement impacts to fish and shellfish should be described or referenced.

If any threatened or endangered species will be potentially affected by the operation of the cooling water intake system, an informal consultation with the appropriate Federal agency (U.S. Fish and Wildlife Service or National Marine Fisheries Service) must be completed, as specified in ESRP/S1 4.6.1. The SEIS should contain a summary of the results of such consultations.

If the reviewer verifies that sufficient information has been provided in accordance with the guidance provided by this ESRP, then the evaluation will support one of the following concluding statements, to be included in the SEIS:

The staff has reviewed the available information relative to potential impacts of the cooling water intake system on the impingement of fish and shellfish. Based on this review, the staff concludes that the potential impacts are SMALL and additional mitigation is not warranted.

The staff has reviewed the available information relative to potential impacts of the cooling water intake system on the impingement of fish and shellfish. Based on this review, the staff concludes

that the potential impacts are (MODERATE or LARGE). Potential mitigation measures have been identified and evaluated.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 122, "EPA Administered Permit Programs: The NPDES Pollution Elimination Systems."

Coastal Zone Management Act, as amended, 16 USC 1451 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*.



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4.1.4 HEAT SHOCK

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of ongoing and potential heat shock impacts to aquatic organisms that may occur as a result of plant cooling system discharges to receiving water bodies. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(B) to address the issue in its environmental report (ER) if the plant employs a once-through cooling system.

The scope of the review directed by this plan includes (1) an analysis of the effects of thermal discharges in sufficient detail to allow the reviewer to predict ongoing and potential heat shock impacts on "important" species (as defined in ESRP/S1 Table 2.2.5), (2) an evaluation of the significance of such impacts, and (3) the preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s):

October 1999

4.1.4-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.1. Obtain information about the power plant's external appearance and layout in enough detail to support the analyses made in ESRP/S1 4.1.4.
- ESRP/S1 2.1.3. Obtain a description of the cooling system and its operational modes in enough detail to support the analyses made in ESRP/S1 4.1.4.
- ESRP/S1 2.2.3. Obtain information concerning water quality at or in the vicinity of the site, in sufficient detail to determine impacts on the aquatic environment, especially as they relate to the cooling system and thermal discharge.
- ESRP/S1 2.2.5. Obtain a description of the aquatic ecology in the vicinity of the site, especially those aspects of the aquatic environment that could potentially be impacted by operation of the cooling system's thermal discharge.
- ESRP/S1 4.6.1. Provide information related to potential impacts of the cooling system discharge on threatened or endangered species not previously addressed, if appropriate.
- ESRP/S1 4.8. Provide a summary statement describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a copy of the plant's current National Pollutant Discharge Elimination System (NPDES) permit
- a copy of the plant's current 316(a) variance (if required, according to Section 316(a) of the Federal Water Pollution Control Act [FWPCA], commonly referred to as the Clean Water Act [CWA] [33 U.S.C. 1326(a)])
- a description of any proposed changes to the plant-cooling-system discharge.

If the preceding documentation is provided, the data and information needs are fulfilled. If the documentation cannot be provided, or the documentation does not reflect the proposed conditions during the renewal term, the reviewer for this ESRP should obtain all of the following information:

- a description of the condenser cooling system; its configuration determines which permits must be acquired and the potential severity of impacts on particular aquatic organisms or systems.
- the temperature duration-mortality relationship and susceptibility of "important" local species to heat

shock (from the ER and the general literature)

- for those “important” species potentially affected by cooling-system-discharge operation, estimates of the regional standing stocks (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a description of applicable State and Federal (40 CFR 423) effluent guidelines and the thermal standards or limitations applicable to the water body to which the discharge is made (including maximum permissible temperature, maximum permissible temperature increase, mixing zones, and maximum rates of increase and decrease) and whether and to what extent these standards or limitations have been approved by the Administrator of the U.S. Environmental Protection Agency (EPA) in accordance with the CWA, as amended.

In addition to the information listed here, additional background information is needed to review the impacts of heat shock from cooling water discharge. The reviewer for this ESRP should obtain this background information from the ER, including site-specific thermal characteristics, as they relate to the discharge system, that describes the aquatic ecology of the site and its environs and the physical impacts of the discharge system.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of heat shock impacts to aquatic ecosystems from the discharge system are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 with respect to ERs and the analysis of potential impacts contained therein
- 10 CFR 51.53(c)(3)(ii)(B) with respect to submission of CWA 316(b) determinations and 316(a) variances or equivalent State permits and supporting documentation
- 40 CFR 122 with respect to NPDES permit conditions specified in the CWA
- 40 CFR 423 with respect to effluent guidelines and thermal standards
- Coastal Zone Management Act of 1972 with respect to natural resources, and land or water use of the coastal zone
- Endangered Species Act of 1973, as amended, with respect to identifying threatened or endangered species and critical habitats and formal or informal consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- The CWA, with respect to restoration and maintenance of the chemical, physical, and biological integrity of water resources

- Fish and Wildlife Coordination Act of 1958 with respect to consideration of fish and wildlife resources and the planning of development projects that affect water resources.

Regulatory guidance and specific criteria in support of the requirements identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to plant-specific-evaluation heat shock for plants with once-through cooling systems.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999) provides guidance to staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Compliance with environmental quality standards and requirements of the CWA is not a substitute for and does not negate the requirement for NRC to weigh the environmental impacts of the proposed action, including any degradation of water quality, and to consider mitigation measures and alternatives to reduce adverse impacts. If a current NPDES permit, CWA 316(a) demonstration (if required), or State permits and supporting documentation acceptable to the EPA (EPA 1973) at the time of LR is available from the permitting authority, the NRC will consider them in its determination of the magnitude of the environmental impacts. When such assessments of impacts of thermal discharge to the aquatic ecosystem are not provided by the applicant, the NRC (possibly in conjunction with the permitting authority and other agencies having relevant expertise) will conduct its own assessment.

Technical Rationale

The technical rationale for evaluating the applicant's potential heat-shock impacts to the aquatic ecosystem is discussed in the following paragraph:

The SEIS should include an analysis that considers the environmental effects of the cooling water discharge system and the alternatives available for reducing or avoiding heat shock. Following the acceptance criteria listed above will help ensure that the environmental impacts of heat shock from the cooling water discharge system will be considered with respect to matters covered by such standards and requirements.

III. REVIEW PROCEDURES

The impacts from cooling system discharges are regulated through the NPDES permit system. The CWA requires that discharge system operation must ensure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the receiving water body. Responsibility for making this determination rests with the EPA or its designees.

Discharge system impacts on aquatic biota may result from the effects of thermal alterations to the receiving water body. Major alterations are usually confined to a limited discharge area (the mixing

zone), whereas lesser alterations may extend over a larger portion of the receiving water body. Adverse effects on biota that are transported through, migrate through, or are attracted to the mixing zone may be acute or chronic, and impacts may be reflected as changes in the populations of “important” species and in the structure and function of the ecosystem.

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impacts of heat shock to the aquatic ecology at the site. Suggested steps in this review are as follows:

- (1) Determine whether the applicant has provided a current NPDES permit with a 316(a) variance (if required) or equivalent State permits and supporting documentation. If these documents are not available, are not current, or do not reflect conditions during the license-renewal term, continue the analysis at Step (2). Otherwise, prepare a statement for the SEIS describing the potential for thermal impacts to aquatic biota at the site that
 - summarizes the permitting documents reviewed
 - states that the required current NPDES permit and 316(a) variance are available and current
 - concludes that there are no significant heat shock impacts to aquatic organisms that may occur as a result of plant cooling system discharges to receiving water bodies.
- (2) Identify the “important” aquatic species susceptible to heat shock and identify any thermal alterations to the receiving water body that may affect the aquatic biota.

If “important” aquatic species are present and are susceptible to heat shock resulting from plant-cooling-system discharges to the receiving water bodies such that the effects will be detectable or may destabilize or noticeably alter population levels, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS describing the potential for thermal impacts to aquatic biota at the site that

- summarizes the permitting information, species data, and methods for quantifying thermal stresses due to heat shock to aquatic biota that have been reviewed
- states that there are no populations of “important” aquatic biota present in the vicinity of the site that will be adversely affected by plant cooling system thermal discharges to the point where changes in their population levels are detectable
- concludes that, because aquatic biota populations will remain stable even if some are affected by heat shock, the cooling system discharge impacts on aquatic biota are SMALL within the context of the analysis in NUREG-1437 and that mitigation is not warranted.

(3) After identifying pertinent aquatic biota and the thermal alterations to receiving-water-body characteristics that may cause heat shock in these aquatic biota, determine and assess the levels of the potential biological impacts of heat shock. Procedures for reviewing the specific thermal impacts of heat shock are listed below. The review should be based on general habitat types such as rivers and streams, lakes and reservoirs, estuaries, and seacoasts.

(a) Consider the following:

- maximum sustained temperatures for each season that are consistent with maintaining desirable levels of productivity
- temperature limitations for survival of brief exposures to upper temperature extremes
- thermal requirements of downstream aquatic life where upstream warming of a cold-water source will adversely affect downstream temperature requirements
- areal extent of the plume
- percent of unaffected area
- physical concentrating factors.

(b) Identify the most thermally intolerant “important” species expected to be affected.

Quantify the magnitude of potential heat shock impacts to the aquatic ecosystem.

Identify and evaluate potential mitigation measures and alternatives.

(4) Prepare a statement for the SEIS describing the potential for adverse impacts to “important” aquatic biota due to heat shock from plant-cooling-system thermal discharges that

- summarizes the relevant information reviewed, including species data, and methods for quantifying impacts to “important” aquatic biota due to heat shock from plant cooling system thermal discharges
- lists the “important” aquatic species present in the vicinity of the site that may be adversely affected by heat shock due to thermal discharges from the plant cooling system and estimates the magnitude of the impacts on these species populations and the aquatic ecosystem
- identifies and describes potential mitigation measures and alternatives
- concludes that heat-shock impacts of the cooling water discharge system on “important” aquatic biota are SMALL, MODERATE, or LARGE within the context of the analysis in NUREG-1437.

IV. EVALUATION FINDINGS

The depth and extent of input to the SEIS will be governed by the attributes of the aquatic resources that could be affected by operation of the station's cooling water discharge systems and by the magnitude of the expected heat shock impacts on these resources. This section of the SEIS should present (1) a list of heat-shock impacts from cooling system discharge operation to aquatic ecosystems, (2) a list of those impacts for which there are measures or controls to limit adverse impacts and the associated measures and controls, (3) the applicant's commitments to limit these impacts, and (4) the staff's evaluation of the adequacy of the applicant's measures and controls to limit adverse impacts. This information should be summarized for the reviewer of ESRP/S1 4.8.

Statements written for the SEIS are described in the previous section and should be included as appropriate for background to the staff's findings. This section may include a summary of staff consultations with the appropriate NPDES administrative agencies having responsibilities under the CWA. Any studies or environmental investigations performed by these agencies that address heat-shock impacts to aquatic biota should be described or referenced.

If any threatened or endangered species not previously addressed under licensing could be potentially affected by thermal discharges due to operation of the cooling water discharge system, an informal consultation with the appropriate Federal agency (U.S. Fish and Wildlife Service or National Marine Fisheries Service) must be arranged as specified in ESRP/S1 3.8.1 and 4.6.1. The SEIS should contain a summary of the results of such consultations.

If the reviewer verifies that sufficient information has been provided in accordance with the guidelines of this ESRP, then the evaluation will support one of the following concluding statements to be included in the SEIS:

The staff has reviewed the available information relative to heat shock impacts resulting from operation of the plant's cooling water discharge system to the aquatic environment on or in the vicinity of the site. Based on this review, the staff concludes that the potential impacts are SMALL, and additional mitigation is not warranted.

The staff has reviewed the available information relative to heat shock impacts resulting from operation of the plant's cooling water discharge system to the aquatic environment on or in the vicinity of the site, including mitigation measures and alternatives. Based on this review, the staff concludes that the potential impacts are (MODERATE or LARGE). Potential mitigation measures have been identified and evaluated.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51.45, “Environmental report.”

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR 122, “EPA Administered Permit Programs: The NPDES Pollution Elimination Systems.”

40 CFR 423, “Steam Electric Power Generating Point Source Category.”

Coastal Zone Management Act, as amended, 16 USC 1451 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Environmental Protection Agency (EPA). 1973. *Water Quality Criteria, 1972*. Committee on Water Quality Criteria, National Academy of Sciences and National Academy of Engineering, EPA-R3-73-033, Ecological Research Series, Washington, D.C.

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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4.1.5 MICROBIOLOGICAL ORGANISMS (PUBLIC HEALTH)

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of the human-health impacts associated with the plant's cooling system during the renewal term. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal is required by 10 CFR 51.53(c)(3)(ii)(G) to assess the impact of the proposed action on public health from thermophilic organisms in the affected water if the plant discharges into a cooling pond, lake, or canal; or discharges into a river having an annual average flow rate of less than $9 \times 10^{10} \text{ m}^3/\text{yr}$ ($3.15 \times 10^{12} \text{ ft}^3/\text{yr}$).

The scope of the review directed by this plan includes an analysis of the impact of thermophilic microorganisms in the affected water in sufficient detail to allow the reviewer to predict potential impacts on human health, to evaluate the significance of such impacts, and to prepare an appropriate statement for the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

October 1999

4.1.5-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.3. Obtain a description of the plant's cooling system, including a description of the location of thermal discharges for the plant in enough detail to support the analyses made in ESRP/S1 4.1.5).
- ESRP/S1 4.1. Obtain an indication of the temperature increases expected for the aquatic environments that are subject to the plant's thermal discharges.
- ESRP/S1 4.7. Provide information related to potential impacts of microbiological organisms on human health not previously addressed, if appropriate.
- ESRP/S1 4.8. Provide a summary statement describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the degree of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the location of the thermal discharges for the plant's cooling system (i.e., a cooling pond, lake, canal) and a characterization of the water body receiving discharges from the cooling system, e.g., a small river (annual average flow rate of less than 9×10^{10} m³/yr [3.15×10^{12} ft³/yr]), large river, large lake or ocean (from the environmental report [ER])
- the temperature increase expected for the aquatic environment that is subject to the plant's thermal discharges (from the ER or ESRP/S1 4.1.4)
- the results of any analyses that have been made for the presence of deleterious thermophilic microorganisms. These include the enteric pathogens *Salmonella* sp. and *Shigella* sp., as well as *Pseudomonas aeruginosa* and thermophilic fungi. In addition, analyses for the presence of unusually high concentrations of the normally present *Legionella* sp. (Legionnaires' disease bacteria) and the free-living amoebae of the genera *Naegleria* and *Acanthamoeba* should be cited (from the ER or the applicant).
- a list of the outbreaks of waterborne diseases in the United States during the previous 10 years in the vicinity of the plant. This list is published regularly by the Centers for Disease Control and Prevention and can be obtained from the Centers for Disease Control and Prevention or from (CDC 1996) Geographical, Environmental & Siting Information System (GEN&SIS).
- an evaluation of available data concerning the occurrence and concentrations of any of the deleterious thermophilic microorganisms listed above in the vicinity of the plant and a determination

of whether any of them are present under conditions and in locations that might be harmful to members of the public. If such an evaluation exists, it may be obtained from the applicant or from the State Public Health Department in the State in which the plant is being constructed.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of human-health impacts from thermophilic microorganisms associated with the plant's cooling system are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(3)(c)(ii)(G) with respect to providing an assessment of the impact of the proposed action on public health from thermophilic organisms in the affected water if the plant uses a cooling pond, lake, or canal or if the cooling system discharges into a river that has an annual average flow rate of less than 9×10^{10} m³/yr (3.15×10^{12} ft³/yr)
- 10 CFR 51.70(b) with respect to permitting an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to giving consideration to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51 Subpart A, Appendix B, Table B-1, with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b) provides guidance on preparation of ERs associated with license renewal.

Technical Rationale

The technical rationale for evaluating the applicant's description of public health impacts of thermophilic microbiological organisms in the cooling system on humans is discussed in the following paragraphs:

The SEIS should include an analysis that considers the environmental effects of the proposed cooling water system and the alternatives available for reducing or avoiding adverse environmental effects, as well as any environmental benefits that may result from the proposed action.

Microorganisms that are associated with cooling towers and thermal discharges can have negative impacts on human health. The presence and numbers of these organisms can be increased by the addition of heat; thus they are called thermophilic organisms. These microorganisms include the enteric pathogens *Salmonella* sp. and *Shigella* sp. as well as *Pseudomonas aeruginosa* and thermophilic fungi. They also include the bacteria *Legionella* sp., which causes Legionnaires' disease, and free-living amoebae of the genera *Naegleria* and *Acanthamoeba*. Exposure to these microorganisms, or in some cases the endotoxins or exotoxins produced by the organisms, can cause illness or death.

Maximum contaminant levels of various microorganisms, including *Legionella*, in public drinking water systems are regulated by 40 CFR 141.70. However, there are no regulations that could be tied to microorganisms that are associated with cooling towers or thermal discharges. Other than the need to assess the impact of thermophilic microorganisms on license renewal, there are no acceptance criteria associated with microbial organisms that may exist in the cooling system and that could affect human health. No Occupational Safety and Health Administration (OSHA) or other legal standards for exposure to microorganisms exist at the present time.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of microbiological organisms associated with the plant's cooling system on the public health.

- (1) Review the discussion of microbiological organisms in the NUREG-1437.
- (2) Review the plant cooling system. If the plant cooling system uses a cooling pond, lake, or canal, or discharges to a river that has an annual average flow rate of less than $9 \times 10^{10} \text{ m}^3/\text{yr}$ ($3.15 \times 10^{12} \text{ ft}^3/\text{yr}$) then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS that describes the plant cooling system, states that the cooling system discharges to a river with a flow exceeding $9 \times 10^{10} \text{ m}^3/\text{yr}$, an ocean, a large lake or other body of water not listed above, and concludes that there will not be a detrimental impact from the thermal discharges on the concentration levels of deleterious thermophilic microorganisms.
- (3) Consult with the State Public Health Department and review any records associated with waterborne disease outbreaks in the region. If the State Public Health Department is concerned about such

outbreaks or the potential for such outbreaks, then continue the analysis at Step (4). Otherwise, prepare a statement for the SEIS describing the plant cooling system that

- outlines the process leading to the determination that there have been no or few waterborne disease outbreaks in the region
- provides a statement from the State Public Health Department indicating their basis for not being concerned about the potential for an impact to the public health from microbiological organisms associated with the cooling system
- concludes that it appears unlikely that thermal discharges from the plant would increase the number of deleterious thermophilic microorganisms to levels that could cause a public health problem.

(4) If the State advises that tests should be conducted for concentration of *N. fowleri* (or other deleterious thermophilic microorganisms) in the receiving waters, the licensee should perform the tests when the facility has been operating at a power level typical of the level anticipated during the license renewal period for at least a month to ensure a steady state population during the sampling. Samples should be taken at locations of potential public use. An evaluation of the data should be performed and a determination made of the magnitude of potential impacts of *N. fowleri* (or other deleterious thermophilic microorganisms) on public health during the license renewal term. If the potential for an impact is determined, then continue the analysis at Step (5). If the State does not advise that tests be conducted, but they still have a concern related to the presence of deleterious thermophilic microorganisms then continue the analysis at Step (5) without the testing. Otherwise, prepare a statement for the SEIS that

- describes the results of the tests that were performed
- provides a statement from the State Public Health Department indicating their basis for not being concerned about the potential for an impact to the public health from microbiological organisms associated with the cooling system as a result of the tests that were performed
- concludes that it appears unlikely that thermal discharges from the plant would increase the number of deleterious thermophilic microorganisms to levels that could cause a public health problem.

(5) Request that the applicant consider mitigative measures to minimize the potential impacts if the results of the consultation with the State Public Health Department and/or the review of records associated with waterborne disease outbreaks in the region show any cause for concern regarding public health concerns related to deleterious thermophilic microorganisms.

Mitigative measures may include

- setting up and executing a monitoring program for deleterious thermophilic microorganisms
- limiting public access to areas affected by the plant's thermal discharges (such as prohibiting public swimming in the mixing zone of the river).

(6) Prepare a statement for the SEIS that

- describes the plant cooling system
- summarizes the information related to any waterborne disease outbreaks in the region
- provides a statement from the State Public Health Department indicating any concerns regarding the potential for an impact to the public health from microbiological organisms associated with the cooling system
- identifies and describes the mitigative measures considered and committed to by the applicant
- concludes that the impacts of microbiological organisms associated with the cooling system are SMALL, MODERATE, or LARGE within the context of the analysis in NUREG-1437, considering the mitigative measures committed to by the applicant.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts on human health from microbiological organisms associated with the plant's cooling system. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

When the reviewer determines that the applicant's plant cooling system discharges to a river with a flow rate of greater than 9×10^{10} m³/yr (3.15×10^{12} ft³/yr) or to another large body of water (such as one of the Great Lakes, or an ocean), then the reviewer should provide a statement for the SEIS similar to the following paragraph:

The applicant's plant cooling system discharges to _____ (Name of river or other large body of water - give flow if a river). There is little potential for a detrimental increase in thermophilic microorganisms that would have a deleterious effect on public health (NUREG-1437). Therefore, the staff concludes that the impact is SMALL.

If the reviewer determines that the plant cooling system uses a cooling pond, lake, or canal or discharges to a small river (9×10^{10} cubic meters per year [3.15×10^{12} cubic feet per year]), and the results of the

analyses related to any regional outbreaks of waterborne diseases indicate that there is little cause for concern, then the reviewer should provide a statement for the SEIS similar to the following paragraph:

The applicant's plant cooling system discharges to a _____. Consequently, there is a potential for deleterious thermophilic microorganisms to be associated with the cooling system. However, the results of analyses and evaluations, including the results of consultation with the State Public Health Department, indicate that the impact of deleterious microbiological organisms during continued operation of the plant during the renewal term are SMALL and mitigation is not warranted.

If the plant uses a cooling pond, lake, or canal or uses a cooling system that discharges to a small river (9×10^{10} cubic meters per year), and the results of the reviewer's analyses related to any regional outbreaks of waterborne diseases, including the consultation with the State Public Health Department, indicate that there is a cause for concern, then the reviewer should provide a statement for the SEIS similar to the following:

The applicant's plant cooling system discharges to a _____. Consequently, there is a potential for deleterious thermophilic microorganisms to be associated with the cooling system. In addition, the results of analyses and evaluations, including consultation with the State Public Health Department, indicate that there is a potential for deleterious microbiological organisms to be present during operation of the plant during the renewal term. The applicant has committed to the following mitigative measures [list]. Therefore, the staff concludes that the impact of microbiological organisms will be [SMALL, MODERATE or LARGE].

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

40 CFR 141.70, “General requirements.”

Centers for Disease Control and Prevention (CDC). 1996. *Surveillance for Waterborne-Disease Outbreaks—United States, 1993-1994*. M.H. Kramer, B.L. Herwaldt, G.F. Craun, R.L. Calderon, D.D. Juraneck. Source: MMWR 45(SS-1): 1-33. April 12, 1996.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.2 TRANSMISSION LINE LAND USE

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential land-use impacts of transmission lines during the license renewal (LR) term. The transmission lines of interest are the lines that connect the plant to the transmission grid. The potential land use impacts of transmission lines during the LR term were evaluated in Section 4.5.3 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the discussion of potential land-use impacts of transmission lines during the LR term in NUREG-1437, (2) identification and evaluation of new information related to potential land-use impacts of transmission lines during the LR term for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Projected land use impacts of transmission lines during the LR term were identified as a Category 1 issue in NUREG-1437 and Table B-1 of Appendix B, Subpart A to 10 CFR 51. The acute effects of electromagnetic fields (EMFs) (electric shock) associated with transmission lines were identified as a Category 2 issue in NUREG-1437 and Table B-1 of Appendix B, Subpart A to 10 CFR 51. A plant-specific review of this issue is required by 10 CFR 51.53(c)(3)(ii)(H). It is addressed in supplemental ESRP (ESRP/S1) 4.2.1. Chronic effects of EMFs were addressed in NUREG-1437 without reaching a conclusion, and an applicant is not required to address this issue in its environmental report (ER). ESRP/S1 4.2.2 addresses this issue.

October 1999

4.2-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 4.7. Provide a list of transmission-line land-use issues for which there is significant new information.
- ESRP/S1 4.8. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the ER)
- any new information included in the ER on the land-use impacts of transmission lines known to the applicant (since this is a Category 1 issue, the applicant is not required under 10 CFR 31.53(c)(3) to include land-use impacts of transmission lines in the ER)
- new and potentially significant information on the land-use impacts of transmission lines during the LR term identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of land-use impacts of transmission lines during the LR term are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft EIS
- 10 CFR 51.71(d) with respect to (1) compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies including applicable zoning and land-use regulations, and (2) analysis of Category 2 issues
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b) provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the renewal term land-use impacts of transmission lines is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2 information developed for those open Category 2 issues applicable to the plant, and any significant new information. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to the land-use impacts of transmission lines during the LR term, as appropriate, and addresses significant new information, if any.

III. REVIEW PROCEDURES

The review of potential land-use impacts of transmission lines during the LR term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of land-use impacts of transmission lines during the LR term in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table lists the renewal term transmission line issues considered in NUREG-1437.
- (2) Determine if there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--------------------------------|
| TERRESTRIAL RESOURCES | | |
| Power line right-of-way management (cutting and herbicide application) | 1 | 4.5.6.1 |
| Bird collisions with power lines | 1 | 4.5.6.2 |
| Impacts of electromagnetic fields on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock) | 1 | 4.5.6.3 |
| Floodplains and wetland on power line right-of-way | 1 | 4.5.7 |
| AIR QUALITY | | |
| Air-quality effects of transmission lines | 1 | 4.5.2 |
| LAND USE | | |
| Power line right-of-way | 1 | 4.5.3 |
| SOCIOECONOMICS | | |
| Aesthetic impacts of transmission lines (LR term) | 1 | 4.5.8 |

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- land-use requirements affecting the land use of transmission lines. Have land-use requirements of governmental agencies that affect the transmission lines changed since the transmission lines were constructed? If so, do the changes affect NRC's evaluation of the LR application?

If the search conducted in this step reveals new information, continue with Step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is no new information, and adopting the conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting the conclusion from NUREG-1437.

- (4) Prepare concise statements of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of Section 4.7 of the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in SEIS Section 4.7 for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be determined by the analysis required to reach a conclusion related to the potential land-use impacts of transmission lines during the LR term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Power line right-of-way management: Based on information in the GEIS, the Commission found that

“The impacts of right-of-way maintenance on wildlife are expected to be of small significance at all sites.”

The staff has not identified any significant new information during its independent review of the _____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of the _____ performed for the _____. Therefore, the staff concludes that there are no impacts of power line right-of-way maintenance during the renewal term beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Power line right-of-way management: Based on information in the GEIS, the Commission found that

“The impacts of right-of-way maintenance on wildlife are expected to be of small significance at all sites.”

(a) Include this phrase only in the final SEIS.

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to power line right-of-way maintenance has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of power line right-of-way maintenance during the renewal term beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Power line right-of-way management: Based on information in the GEIS, the Commission found that

“The impacts of right-of-way maintenance on wildlife are expected to be of small significance at all sites.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to power line right-of-way maintenance has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.]

The staff has determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of power line right-of-way maintenance during the renewal term beyond those discussed in the GEIS.

(a) Include this phrase only in the final SEIS.
(b) Include this phrase only in the final SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION ENVIRONMENTAL STANDARD

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4.2.1 ELECTROMAGNETIC FIELDS—ACUTE EFFECTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the electric shock from transmission line induced currents. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(H) to address the issue in its environmental report (ER) if the transmission lines constructed for the specific purpose of connecting the plant to the transmission system do not meet the recommendations of the National Electrical Safety Code (NESC) (IEEE 1997) for preventing electric shock from induced currents.

The scope of the review directed by this plan should include determining if transmission lines constructed for the purpose of connecting the plant to the transmission system meet the recommendations of the NESC for preventing electric shock from induced currents. If not, the scope includes assessing the impact of the proposed action on the potential shock hazard from the transmission lines. The scope also includes preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

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4.2.1-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001



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The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.7. Obtain the locations of the transmission lines that were constructed to connect the plant to the transmission system.
- ESRP/S1 4.2. Provide any new potentially significant information related to the environmental effects of transmission lines.
- ESRP/S1 4.8. Provide a summary of the review conducted and the conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors, and the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the transmission lines constructed to connect the plant to the transmission system
- verification of initial transmission line conformance with NESC criteria (NESC edition to which the lines were built or a later edition)
- a description of a transmission line management program, if any, including continued compliance with NESC electrical shock provisions
- plans to bring lines into conformance with NESC criteria if not already in compliance. Consider basic electrical design parameters, including transmission design voltage or voltages, line capacity, conductor type and configuration, spacing between phases, minimum conductor clearances to ground, maximum predicted electric field strength(s) at 1 m above ground, the predicted electric field strength(s) at the edge of the right-of-way in kilovolts per meter (kV/m), and the design bases for these values (from the ER)
- (if NESC clearance standards cannot be demonstrated) a transmission line survey identifying sites or areas that do not meet the standards and that may not meet the standards following anticipated changes in transmission-line operations or changes in land use in the right-of-way.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of transmission line electric shock hazards are based on the relevant requirements of the following regulation:

- 10 CFR 51.53(c)(3)(ii)(H) with respect to assessing impacts of transmission systems not meeting NESC criteria.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to the staff's generic conclusions related to the environmental impacts of LR and identifies areas where site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.
- NESC (IEEE 1997) provides guidance with respect to shock hazards.

Technical Rationale

The technical rationale for evaluating the shock potential of the applicant's power transmission system is discussed in the following paragraph:

The requirements of 10 CFR 51.53(c)(ii)(H) specify that an assessment of the potential shock hazard from the transmission lines must be provided for those transmission lines connecting the plant to the transmission system that do not meet the recommendations of the NESC for preventing electric shock from induced currents. The design parameters of the system and the resulting field strengths expected to be associated with power transmission are used in addressing the acute shock hazards.

III. REVIEW PROCEDURES

The review of potential electrical shock hazards from induced transmission line currents should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the issues associated with electric shock hazards from induced transmission line currents in NUREG-1437.
- (2) Review the route of the transmission lines constructed to connect the plant to the transmission system.
- (3) Review the applicant's analysis demonstrating that the transmission lines continue to meet NESC clearance standards to which they were built.

If the applicant does not state that transmission lines constructed to connect the plant to the grid meet electrical shock hazard of the NESC code or the applicant's demonstration is not adequate, then continue the review at Step (4). Otherwise, prepare a statement for the SEIS that

- describes the route of the transmission line constructed to connect the plant to the transmission system
- describes the line (voltage, capacity, conductor configuration, minimum conductor-to-ground clearance, and maximum predicted electrical field strengths 1 m above ground, etc.)
- provides the basis for the staff evaluation
- concludes that the system meets the criteria of the NESC.

(4) Identify any sites or areas where the transmission lines fail to meet the NESC clearance standards. These areas should be shown on maps, photographs, or drawings to be included in the SEIS.

(5) Identify measures that could be taken to meet the standards in the areas where the transmission lines fail to meet the NESC standards. Determine which measures the applicant plans or proposes to undertake, if any, and whether those measures will result in transmission lines meeting the standards.

(6) Identify and evaluate mitigation measures for those areas where the transmission lines will not meet NESC standards.

(7) Prepare a statement for the SEIS that

- describes the route of the transmission line constructed to connect the plant to the transmission system
- describes the line (voltage, capacity, conductor configuration, minimum conductor-to-ground clearance, and maximum predicted electrical field strengths 1 m above ground, etc.) and potential shock hazard from the transmission lines
- identifies sites or areas where NESC standards will not be met and explains why the standards are not appropriate to the situation or why the applicant will not make modifications to meet standards
- describes measures to mitigate potential impacts in those areas
- provides the significance level of the environmental impacts.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential electric shock from transmission line induced currents. The information that should be included in the SEIS is described in the review procedures. Examples of concluding statements that might be appropriate for inclusion in an SEIS are provided below.

If the transmission line constructed to connect the plant to the transmission system meets NESC shock hazard standards, a concluding statement similar to the following would be appropriate:

Based on an independent review of information provided by the applicant, the staff concludes the transmission line constructed to connect the plant to the transmission system meets the shock hazard standards of the National Electrical Safety Code. The impacts associated with continued use of the line during the renewal term are SMALL, and further mitigation is not warranted.

If the transmission line does not meet NESC shock hazard standards, a concluding statement similar to the following might be appropriate for the SEIS:

The transmission line constructed to connect the plant to the transmission system does not meet the shock hazard standards of the National Electrical Safety Code in the following sites or areas:

(List).

The applicant has committed to the following measures to mitigate potential impacts in these sites or areas.

(List measures)

With these mitigation measures, the staff concludes that the potential impacts of electric shock from transmission line induced currents during the renewal term is (SMALL, MODERATE, or LARGE, as appropriate), and that further mitigation (is/is not) warranted.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

Institute of Electrical and Electronics Engineers, Inc. (IEEE). 1997. *The National Electrical Safety Code (NESC)*, New York.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION ENVIRONMENTAL STANDARD

REVIEW PLAN OFFICE OF NUCLEAR REACTOR REGULATION

4.2.2 ELECTROMAGNETIC FIELDS--CHRONIC EFFECTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of chronic effects of electromagnetic fields (EMFs). This issue was addressed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. No conclusion was reached concerning whether chronic effects occur from electromagnetic fields (EMF) from transmission lines, and an applicant for license renewal (LR) is not required to submit information on this issue. However, until a conclusion on the issue is reached, staff should prepare a statement that notes the Commission's position set forth in NUREG-1437 and Appendix B, Subpart A to 10 CFR 51.

The scope of the review directed by this plan covers a review of information published since the analysis leading to NUREG-1437 and preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 4.8. Provide a summary of the review conducted and the conclusions reached.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The National Institute of Environmental Health and Safety has taken the position that it has the responsibility for declaring whether a hazard from exposure to EMFs exists and the magnitude of the hazard. Both the EPA and the National Institute for Occupational Safety and Health maintain EMF hot lines. The reviewer for this ESRP should contact these agencies to determine if recent review has produced conclusive evidence of adverse chronic effects from exposure to EMFs.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of power transmission line siting are based on the relevant requirements of the following regulation:

- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues related to LR.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.

Technical Rationale

The technical rationale for evaluating the potential chronic effects of exposure to EMFs is discussed in the following paragraph:

The literature related to chronic effects of exposure to EMFs is described in NUREG-1437. The scientific evidence was found to be inconclusive at that time, and as a result, the NRC could not categorize chronic effects of EMFs as either a Category 1 or 2 issue. The National Institute of Environmental Health Sciences has recently concluded (NIEHS 1999) that there is insufficient scientific evidence of health effects to warrant aggressive regulatory concern. However, this area is continuing to be reviewed.

III. REVIEW PROCEDURES

The review of potential chronic effects of EMFs should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the issues associated with chronic effects of EMFs in NUREG-1437.

- (2) Contact the appropriate Federal health agencies to determine if a consensus has been reached that there are adverse health effects from EMFs.

If it is determined that the appropriate Federal agencies have reached a consensus, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS concluding that the scientific evidence related to chronic health effects is inconclusive and that the NRC is monitoring research initiatives in this area.

- (3) Determine if the NRC has made a finding that consensus that adverse effects exists and has established a requirement for applicants for LR to submit a plant specific review of the health effects as part of their application. If the NRC has not made a finding and established a requirement, request instructions from the Environmental Project Manager.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to potential chronic health effects of EMFs. An example of a statement that is appropriate for inclusion in an SEIS in the absence of consensus by the appropriate Federal health agencies is provided below.

The NRC presented its analysis of the scientific evidence related to chronic effects of exposure to electromagnetic fields in NUREG-1437. It found the evidence to be inconclusive. The appropriate Federal health agencies have been contacted, and it has been determined that they have not reached a consensus that there are chronic health effects from exposure to electromagnetic fields. Therefore, the staff concludes that it is not appropriate to conduct a plant specific evaluation of this issue.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

National Institute of Environmental Health Sciences (NIEHS). 1999. *NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*. NIH Publication No. 99-4493. National Institute of Health, Research Triangle Park, North Carolina.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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4.3 RADIOLOGICAL IMPACTS OF NORMAL OPERATION

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential radiological impacts of normal operation during the renewal term and preparation of input to the supplemental environmental impact statement (SEIS).

The scope of the review directed by this plan includes (1) review of the discussion of potential radiological impacts of normal operations during the renewal term in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), (2) identification and evaluation of new information related to potential radiological impacts of operation during the renewal term for significance, and (3) preparation of input to the SEIS. All of the issues related to radiological impacts of normal operation are Category 1 issues.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.1.4. Obtain a description of the plant radioactive waste treatment system.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.6. Obtain a description of the plant operations and maintenance during the renewal term.
- ESRP/S1 2.2.7. Obtain a description of the expected radiological impacts of the plant.
- ESRP/S1 4.7. Provide a list of radiological issues for which there is significant new information.
- ESRP/S1 4.8. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on radiological issues (from the environmental report [ER] and site visit)
- new information on the radiological impacts of operation during the renewal term known to the applicant (from the ER and site visit)
- new and potentially significant information on the impacts of renewal-term operations on radiological issues identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of radiological impacts of operation during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the license renewal (LR) stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft EISs at the LR stage

- 10 CFR 51.95(c)(4) with respect to contents of the SEIS and consideration of significant new information
- 10 CFR 51 Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential radiological impacts of normal operations during the renewal term is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2 information developed for those open Category 2 issues applicable to the plant and any significant new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to the preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to radiological impacts of normal operation during the renewal term, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential radiological impacts of normal operation during the renewal term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the potential radiological impacts of operation during the renewal term in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.

The following table lists the radiological issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--------------------------------|
| HUMAN HEALTH | | |
| Radiation exposures to the public during the renewal term | 1 | 4.6.2 |
| Occupational radiation exposures during the renewal term | 1 | 4.6.3 |

(2) Determine if there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- environmental radiation standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare a section for SEIS describing the search for new information, stating a conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing the new information found, presenting results of evaluation of significance, and adopting a conclusion from NUREG-1437.

(4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of Section 4.7 of the SEIS.

- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of operation during the renewal term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Radiation exposures to the public (license renewal term): Based on information in the GEIS, the Commission found that

“Radiation doses to the public will continue at current levels associated with normal operations.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS,^(a) or its evaluation of other available information, including reports of studies of the _____ performed for the _____. Therefore, the staff concludes that there are no impacts of radiation exposures to the public during the renewal term beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Radiation exposures to the public (license renewal term): Based on information in the GEIS, the Commission found that

“Radiation doses to the public will continue at current levels associated with normal operations.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including

-
- (a) Include this phrase only in the final SEIS.
(b) Include this phrase only in the final SEIS.

reports of studies of the _____ performed for the _____. The following new information related to radiation exposures to the public has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of radiation exposures to the public during the renewal term beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Radiation exposures to the public (license renewal term): Based on information in the GEIS, the Commission found that

“Radiation doses to the public will continue at current levels associated with normal operations.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to radiation exposures to the public during the renewal term has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff has determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of radiation exposures to the public during the renewal term beyond those discussed in the GEIS.

(a) Include this phrase only in the final SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements"

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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4.4 SOCIOECONOMIC IMPACTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of potential impacts of plant operations during the renewal term on socioeconomics and preparation of introductions to supplemental ESRPs (ESRP/S1s) 4.4.1 through 4.4.6. The potential impacts of plant operations during the renewal term on socioeconomics were evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of refurbishment on socioeconomic issues in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of plant operations during the renewal term on socioeconomics for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS). The potential impacts of the plant operations during the renewal term on

- housing
- public services (water supply)
- offsite land use
- transportation
- historic and archeological resources

are identified as Category 2 issues in NUREG-1437 and Table B-1 of Appendix B, Subpart A to

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

10 CFR 51. The plant-specific review of these issues required by 10 CFR 51.53(c)(3)(ii)(I), 10 CFR 51.53(c)(3)(ii)(J), and 10 CFR 51.53(c)(3)(ii)(K) are addressed specifically in ESRP/S1s 4.4.1 through 4.4.5.

Environmental justice was not addressed in NUREG-1437; therefore the staff is required to address environmental justice in the plant-specific supplements to NUREG-1437. ESRP/S1 4.4.6 provides guidance on review of information related to environmental justice.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 4.7. Provide a list of the socioeconomic issues for which there is significant new information.
- ESRP/S1 4.8. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- information on the impacts of plant operations on socioeconomic issues known to the applicant (from the environmental report [ER])
- a description of the applicant's process for identifying new and potentially significant information on socioeconomic issues (from the ER)
- new and potentially significant information on the impacts of plant operations during the renewal term on socioeconomic issues identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of plant operations during the renewal term on socioeconomics are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(c) with respect to analysis of socioeconomic data
- 10 CFR 51.45(D) with respect to discussion of compliance with applicable environmental quality standards

- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the license renewal (LR) stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft environmental impact statements (EISs) at the LR stage
- 10 CFR 51.95(c)(4) with respect to SEIS contents and consideration of significant new information
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants
- Executive Order 12898 (59 FR 7629) with respect to Federal actions to address environmental justice in minority and low-income populations.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential socioeconomic impacts is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2 information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to

preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of plant operations during the renewal term on socioeconomic issues, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of potential impacts of operation during the renewal term on socioeconomics should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of plant operations during the renewal term on socioeconomics in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table gives the socioeconomic issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|--|----------|---|
| SOCIOECONOMICS | | |
| Public services: education, public safety, social services, and tourism and recreation | 1 | 4.7.3 4.7.3.1 4.7.3.3 4.7.3.4 4.7.3.6 |
| Aesthetic impacts (license renewal term) | 1 | 4.7.6 |

- (2) Determine whether there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?

- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare a section for SEIS describing search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare a section for the SEIS describing the search for new information, summarizing the new information found, presenting results of evaluation of significance, and adopting the conclusion from NUREG-1437.

(4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in the SEIS.

(5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437, modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of plant operations on socioeconomics. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Public services: public safety, social services, and tourism and recreation: Based on information in the GEIS, the Commission found that

“Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.”

The staff has not identified any significant new information during its independent review of the

____ ER, the staff's site visit, the scoping process, its review of public comments on the draft SEIS,^(a) or its evaluation of other available information, including reports of studies of the _____ performed for the _____. Therefore, the staff concludes that there are no impacts on public services: public safety, social services, and tourism and recreation during the renewal term beyond those discussed in the GEIS.

Plant-specific analyses have been conducted for Category 2 socioeconomic issues and environmental justice. These issues are addressed below.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Public services: public safety, social services, and tourism and recreation: Based on information in the GEIS, the Commission found that

“Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS,^(b) and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information on impacts on public safety, social services, and tourism and recreation has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts on public safety, social services, and tourism and recreation during the renewal term beyond those discussed in the GEIS.

Plant-specific analyses have been conducted for Category 2 socioeconomic issues and environmental justice. These issues are addressed below.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

-
- (a) Include this phrase only in the final SEIS.
 - (b) Include this phrase only in the final SEIS.

Public services: public safety, social services, and tourism and recreation: Based on information in the GEIS, the Commission found that

“Impacts to public safety, social services, and tourism and recreation are expected to be of small significance at all sites.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS,^(c) and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information on impacts on public safety, social services, and tourism and recreation has been identified

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g. 4.7.1, 4.7.2, etc.])

The staff has determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts on public safety, social services, and tourism and recreation beyond those discussed in the GEIS.

Plant-specific analyses have been conducted for Category 2 socioeconomic issues and environmental justice. These issues are addressed below.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission’s regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, “Domestic Licensing of Production and Utilization Facilities.”

10 CFR 51.45, “Environmental report.”

10 CFR 51.53, “Postconstruction environmental reports.”

(c) Include this phrase only in the final SEIS.

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 51 Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-income Populations.” *59 Federal Register* 7629-7633 (1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL STANDARD
 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

4.4.1 HOUSING IMPACTS DURING OPERATIONS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts of plant operations on housing during the license renewal (LR) term. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of plant operations on housing in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of plant operations on housing for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1s 2.1 and 2.1.6. Obtain a detailed description of the proposed plant operations during the renewal term.
- ESRP/S1 2.2.8. Obtain a description of the local housing stock, market trends, and expansion plans.

October 1999

4.4.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.6.1. Obtain a description of the housing impacts during refurbishment. Summarize any housing impacts during operations, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.7. Obtain descriptions of any new and significant information related to operations.
- ESRP/S1 4.8. Provide a summary of any housing impacts during operations, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.
- ESRP/S1 8.2. If the reviewer concludes that proposed operations during the renewal term will result in adverse impacts on housing markets that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the ER)
- information on the impacts of plant operations on housing during the renewal term known to the applicant (from the ER)
- information on the impacts of plant operations on housing during the renewal term identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of work force changes, emphasizing refueling outages (from the ER)
- the number of housing units, vacancy rates, price trends, and information on other projects that may be occurring during the renewal term in the vicinity of the plant (from the ER, local housing authorities and governments, realtors, and other knowledgeable local sources).

The size of the work force required during the renewal term is an important determinant of population growth. The permanent LR term work force is expected to include those personnel who were onsite during the initial license term, up to 60 additional permanent operations workers per unit, and temporary refueling and maintenance workers during periodic plant outages. This is likely to be important only during the time period when the housing market is tight, and housing is required for a substantial number of workers during a periodic outage.

The LR term of the plants will be very much like the original operations period, but will include additional safety and maintenance activities. Thus, impacts on housing marketability and values that have occurred during operations will continue during the LR term. At all case study sites, only small impacts on housing value and marketability are projected to continue.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of housing impacts from operations during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of Category 2 issues
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), contains guidance to the applicant concerning the analysis of potential housing impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during the renewal term.

Technical Rationale

The technical rationale for evaluating the applicant's potential housing impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the license renewal stage. The review conducted under this

ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of plant operations on housing during the renewal term, as appropriate. Because of the site-specific and time-specific nature of housing market issues, 10 CFR 51, Subpart A, Appendix B, explicitly requires housing impacts during operations to be considered in LR.

III. REVIEW PROCEDURES

To analyze the impact of plant operations during the renewal term on the local housing market, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of plant operations during the renewal term on housing in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of housing impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Generally, operating impacts other than those related to tax revenues will be less than the corresponding impacts of refurbishment. It is not necessary to re-address impacts determined to be minor by the reviewer for ESRP/S1 3.6.1.

NUREG-1437 states that no demand related impacts are expected during regular operations, and only small impacts to housing value and marketability are projected. During continuing periodic refueling/maintenance outages, housing demand impacts during refueling/maintenance may range from small to large at various sites, depending on the size of the required work force and the isolation of the site. The observed relationship between demographic characteristics and projected housing impacts at the NUREG-1437 case study sites suggests that large impacts are possible when a work force exceeding 600 persons is required at a site located in a low-population area or in an area that has or recently has had growth control measures that limit housing development.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on housing, proceed to Step (4). Otherwise, if the reviewer determines that there will be no impacts on housing or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the housing impacts associated with the operating staff, as follows:

- Determine the operating staff requirements by predicting the number of workers originating from within the region and the number of in-migrants. Certain characteristics of the LR term work force (e.g., percentage residing in the study area, percentage moving into the study area, percentage of in-migrants accompanied by families) ordinarily can be assumed to be similar to those of the current plant staff.
- Predict the geographic distribution of in-migrants.
- Estimate the overall impact of in-migrants on regional income, employment, and population.
- Estimate the effects of in-migrants and induced economic activity on housing demand, housing prices and availability, and vacancy rates.^(a)

(5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices, and describe the mechanisms available to these communities to plan for and accommodate change induced by plant operation.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local housing markets are likely to be affected by plant operations during the renewal term, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such housing market impacts. NUREG-1437 states that SMALL impacts result when no discernible change in housing availability occurs, changes in rental rates and housing values are similar to those occurring statewide, and no housing construction or conversion occurs. MODERATE impacts result when there is a discernible reduction in housing availability, rental rates and housing values exceed the inflation rate elsewhere in the state, and minor housing conversions or temporary additions occur. LARGE impacts occur when project related demand results in very limited housing availability, considerable increases in rental rates and housing values, and substantial conversion of housing units.
- any mitigative measures for which credit is being taken to reduce housing market concerns.

(a) In estimating these impacts at the local level, the relative availability of public services among communities may be an important determining factor of the residence of new workers. See NRC (1998).

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of housing impacts.

- (6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or more evenly distribute impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (7) Based on the results of the assessments listed above, prepare the following for the SEIS:
 - a brief description of pathways by which the work force required for operations during the renewal term may interact with local housing market facts to result in MODERATE or LARGE impacts
 - a statement (qualitative or quantitative, as appropriate) about the degree to which regional housing markets are expected to receive impacts, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on locations of numbers of in-migrants, impacts on population, location and availability of housing) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce housing-market concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of renewal term operations on housing markets. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during the renewal term, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that the housing market will not experience impacts as a result of activities during the renewal term.

If the reviewer determines that there will be a discernible effect as a result of operations activities during the renewal term, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact, as follows.

The staff has reviewed the available information relative to local housing markets. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to local housing markets. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to local housing markets. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. *In the Matter of Louisiana Energy Services Claiborne Enrichment Center*, Docket 70-3070-ML. CLI 98-3. Washington, D.C., April 3, 1998.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL STANDARD
 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

4.4.2 PUBLIC SERVICES: PUBLIC-UTILITY IMPACTS DURING OPERATIONS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on public utility services during the renewal term. Water supply was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER). All other public utilities are considered as Category 1 issues.

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts from plant operations during the renewal term on public utilities in NUREG-1437, (2) identification and evaluation of site-specific information related to potential impacts of plant operations on public utilities for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers of information covered by the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1s 2.1 and 2.1.6. Obtain a detailed description of the proposed plant operations during the renewal term.
- ESRP/S1 2.2.8. Obtain a description of the local public-utility system, trends, and expansion plans, if any. Concentrate on the local water supply.

October 1999

4.4.2-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.6.2. Obtain a description of the public utility impacts during refurbishment. Summarize any public-utility impacts during operations, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.7. Obtain descriptions of any site-specific information related to operations.
- ESRP/S1 4.8. Provide a summary of any public utility impacts during operations, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.
- ESRP/S1 8.2. If the reviewer concludes that proposed operations will result in adverse impacts on the regional public utility system that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternate energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the ER)
- information on the impacts of plant operations on public utilities known to the applicant (from the ER)
- information on the impacts of plant operations on public utilities identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of population changes, emphasizing refueling outages (from the ER and, as appropriate, from local and regional authorities such as planning bodies)
- the demand for water from particular sources with which the plant may compete, especially during drought conditions, in the context of population growth and other projects that may be occurring during the renewal term in the vicinity of the plant (from the ER and, as appropriate, the affected service providers, such as the local water district or planning commission).

The utility that is least likely to accommodate growth is the local water supplies, where there is sometimes a moderate conflict. Because the case studies indicate that some public utilities may be overtaxed during peak periods, the impacts to public utilities could be moderate for other utilities in some cases, although most sites would experience only small impacts.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of public utility impacts from operations during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS contents and consideration of Category 2 issues
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), contains guidance to the applicant concerning the analysis of potential public-utility impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during the renewal term.

Technical Rationale

The technical rationale for evaluating the applicant's potential public-utility impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of plant operations on public utilities during the renewal term, as appropriate.

It is explicitly required by 10 CFR 51, Subpart A, Appendix B, that water supply impacts during operations be considered in LR. This is because impacts can usually be judged primarily from local water supply conditions existing at the time of the project at a particular site and cannot be easily

forecasted generically. A site-specific review will be necessary to determine whether impacts are likely to be SMALL or MODERATE and whether mitigation measures may be warranted. Impacts of plant operations on other public utilities generally are expected to be within the limits of NUREG-1437; however, issues with respect to public utilities could also be triggered by new and significant information.

III. REVIEW PROCEDURE

To analyze the impact of plant operations during the renewal term on local public utilities, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of plant operations on public utilities in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which they are aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered.
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of public utility impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Generally, operating impacts will be less than the corresponding impacts of refurbishment. It should not be necessary to re-address impacts determined to be minor by the reviewer for ESRP/S1 3.6.2, unless later population growth or later projects are expected to create water-shortage problems later in the renewal term.

Overall, NUREG-1437 notes that there have been minimal impacts to most public utilities as a result of plant operations. The existing capacity of public utilities was sufficient to accommodate the small influx of plant staff, and some locales experienced a noticeable decrease in the level of demand for services with the completion of original plant construction. Although impacts to public utilities during LR would be very similar to those that occurred during past operations, an increased problem with water availability may occur in conjunction with plant demand and plant-related population growth as a result of current water shortages in some areas. These shortages may result in moderate impacts to public water supplies at sites with limited water availability.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on public utilities, proceed to Step (4). Otherwise, if the reviewer determines that there are no impacts on local public utilities or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the public utility system impacts associated with the operating staff, as follows:

- Determine the population growth resulting from operating staff requirements by predicting the number of workers originating from within the region and the number of daily commuters. Certain characteristics of the renewal term work force (e.g., percentage residing in the study area, percentage moving into the study area, percentage of in-migrants accompanied by families) ordinarily can be assumed to be similar to those of the current plant staff.
- Predict the geographic distribution of in-migrants.
- Estimate the overall impact of in-migrants on regional employment and population.
- Estimate the impact of other known or projected projects on demand for utilities.
- Estimate the effects of in-migrants and induced economic activity on public utility demand, especially local water supplies.

(5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices and public utility infrastructure and describe the mechanisms available to these communities to plan for and accommodate changes induced by plant operations during the renewal term.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local public utility services are likely to be affected by plant operations during the renewal term, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such public utility impacts. NUREG-1437 states that impacts are **SMALL** if the existing public utility infrastructure (facilities, programs, and staff) could accommodate any plant-related demand without a noticeable effect on the level of service. **MODERATE** impacts arise when the demand for public utility service or use of the public utility infrastructure is sizeable and would noticeably decrease the level of service (e.g., through water conflicts during drought) or require additional resources to maintain the level of service. **LARGE** impacts would result when new programs, upgraded or new facilities, or substantial additional staff are required because of plant related demand.
- any mitigative measures for which credit is being taken to reduce public utility system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of public utility impacts.

- (6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or more evenly distribute impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (7) Based on the results of the assessments listed above, prepare the following for the SEIS:
- a brief description of pathways by which the work force required during operations in the renewal term may interact with the regional public utility system to result in MODERATE or LARGE impacts
 - a statement (qualitative or quantitative, as appropriate) about the degree to which regional public utility infrastructure and services are expected to receive impacts, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on impacts to population, location, and water supplies, facilities, and services) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce public utility infrastructure and service concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of operations during the renewal term on public utilities. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during the renewal term, a statement similar to the following paragraph is appropriate:

Based on review of the information provided by the applicant, the staff finds that the public utility system will not experience impacts as a result of operations during the renewal term.

If the reviewer determines that there will be a discernible effect as a result of operations during the renewal term, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact, as follows:

The staff has reviewed the available information relative to the local public utility system. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to the local public utility system. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated....

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to the local public-utility system. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated....

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. NRC Regulatory Guide 4.2, Supplement 1, 1999. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL STANDARD
 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

4.4.3 OFFSITE LAND USE DURING OPERATIONS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on offsite land use during the renewal term. Offsite land use was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(I) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of plant operations during the renewal term on offsite land use in NUREG-1437, (2) identification and evaluation of site-specific information related to potential impacts of plant operations on offsite land use for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer should obtain input from or provide input to reviewers of information covered by the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1s 2.1 and 2.1.6. Obtain a detailed description of the proposed plant operations during the renewal term.
- ESRP/S1 2.2.8. Obtain a description of the local offsite land use, trends, and development plans, if any.

October 1999

4.4.3-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, 1999, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.6.2. Obtain a description of the offsite impacts during refurbishment. Summarize any offsite land-use impacts during the renewal term, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.7. Obtain descriptions of any site-specific information related to operations during the renewal term.
- ESRP/S1 4.8. Provide a summary of any offsite land-use impacts during the renewal term, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.
- ESRP/S1 8.2. If the reviewer concludes that proposed operations during the renewal term will result in adverse impacts on the regional offsite land use that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternate energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the environmental report [ER])
- information on the impacts of plant operations during the renewal term on offsite land use known to the applicant (from the ER)
- information on the impacts of plant operations on offsite land use identified by the public
- the size and timing of population changes, emphasizing refueling outages (from the ER and from local experts such as local planning bodies)
- the plans for offsite land development in the context of population growth and other projects that may be occurring during the renewal term in the vicinity of the plant (from the ER and from local experts such as local governments and planning bodies).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of offsite land-use impacts from operations during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment

- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS contents and consideration of Category 2 issues
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), contains guidance to the applicant concerning the analysis of potential offsite land-use impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts during the renewal term.

Technical Rationale

The technical rationale for evaluating the applicant's potential offsite land-use impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of plant operations on offsite land use during the renewal term, as appropriate.

10 CFR 51, Subpart A, Appendix B, explicitly requires offsite land-use impacts during operations to be considered in LR. This is because impacts can usually be judged primarily from local land uses existing at the time of the project near a particular site and cannot be easily forecasted generically. A site-specific review will be necessary to determine whether impacts are likely to be SMALL or MODERATE and whether mitigation measures may be warranted.

III. REVIEW PROCEDURES

To analyze the impact of plant operations during the renewal term on offsite land use, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of plant operations on offsite land use in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of offsite land-use impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Generally, operating impacts will be less than the corresponding impacts of refurbishment. It should not be necessary to re-address impacts determined to be minor by the reviewer for ESRP/S1 3.6.4, unless later population growth or later development projects are expected to induce land-use changes later in the renewal period.

Overall, NUREG-1437 notes that there have been minimal impacts to most land use as a result of plant operations. However, new land-use impacts could result from plant related population growth or from the use by local governments of the plants' tax payments to provide public services that encourage development.

If, based on this analysis, the reviewer determines that there will be more than minor impacts on the offsite land use, then the reviewer should proceed to Step (4). Otherwise, if the reviewer determines that there are no impacts on offsite land use or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

- (4) Analyze the offsite land-use impacts associated with operations during the renewal term, as follows:
 - Determine the new land-use impacts that could result from plant-related population growth or from the use by local governments of the plants' tax payments to provide public services that encourage development.
 - Predict the geographic distribution of new development, if any.
 - Estimate the effects of in-migrants and induced economic activity on offsite land use.

- (5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices, infrastructure, and offsite land use, and describe the mechanisms available to these communities to plan for and accommodate changes induced by plant operations.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local land-use patterns are likely to be affected by plant operations during the renewal term, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of changes in offsite land use. NUREG-1437 states that the magnitude of change to offsite land use is considered SMALL if very little new development and minimal changes to an area's land-use pattern result. MODERATE change results if considerable new development and some changes to the land-use pattern occur. The magnitude of change is LARGE if large-scale new development and major changes in the land-use pattern occur. During the renewal term, new land-use impacts could result from plant-related population growth or from the use by local governments of the plants' tax payments to provide public services that encourage development
- any mitigative measures for which credit is being taken to reduce offsite land-use system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of offsite land-use impacts.

- (6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (7) Based on the results of the assessments listed above, prepare the following for the SEIS:
- a brief description of pathways by which the workforce required during operations in the renewal term may interact with the regional offsite land use to result in MODERATE or LARGE impacts
 - a statement (qualitative or quantitative, as appropriate) about the degree to which regional offsite land use is expected to receive impacts, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on development plans and population increases) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce offsite land-use concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of renewal-term operations on offsite land use. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during the renewal term, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that offsite land use will not experience impacts as a result of operations during the renewal term.

If the reviewer determines that there will be a discernable effect as a result of operations during the renewal term, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to offsite land use. Based on this review, the staff concludes that the impact is **SMALL**, and mitigation is not warranted.

The staff has reviewed the available information relative to offsite land use. Based on this review, the staff concludes that the impact is **MODERATE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **MODERATE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated....

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to offsite land use. Based on this review, the staff concludes that the impact is **LARGE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **LARGE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated....

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL STANDARD
 REVIEW PLAN**
 OFFICE OF NUCLEAR REACTOR REGULATION

4.4.4 PUBLIC SERVICES: TRANSPORTATION IMPACTS DURING OPERATIONS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) supplement directs the staff's analysis and assessment of potential impacts on transportation services during the renewal term. Transportation was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(J) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of plant operations during the renewal term on transportation in NUREG-1437, (2) identification and evaluation of site-specific information related to potential impacts of plant operations on transportation for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1s 2.1 and 2.1.6. Obtain a detailed description of the proposed plant operations during the renewal term.
- ESRP/S1 2.2.8. Obtain a description of the local transportation system, trends, and expansion plans, if any. Concentrate on choke points in the nearby road network.

October 1999

4.4.4-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 3.6.5. Obtain a description of the transportation impacts during refurbishment. Summarize any transportation impacts of operations during the renewal term, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.7. Obtain descriptions of any new and significant information related to operations.
- ESRP/S1 4.8. Provide a summary of any transportation impacts of operations during the renewal term, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.
- ESRP/S1 8.2. If the reviewer concludes that proposed operations during the renewal term will result in adverse impacts on the regional transportation system that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternate energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the ER)
- information on the impacts of plant operations on transportation known to the applicant (from the ER)
- information on the impacts of plant operations on transportation identified by the public in scoping meetings or correspondence related to the application for LR
- the size and timing of work force changes, emphasizing refueling outages (from the ER)
- the number of commuters along particular routes, especially during outages, and information on other projects that may be occurring during the renewal term in the vicinity of the plant (from the ER and local experts such as government transportation planners)
- Transportation Research Board's level of service (LOS) data for nearby road links (Transportation Research Board 1985). LOS data, when available, can be obtained from local planners, county engineers, or local or State departments of transportation.

The size of the work force required during the LR term is an important determinant of population growth. The permanent LR term work force is expected to include those personnel who were on site during the initial license term, up to 60 additional permanent operations workers per unit, and temporary refueling and maintenance workers during periodic plant outages. This is likely to be important only during periods when the transportation system is near capacity, and only at selected locations.

The LR term of the plants will be very much like the original operations period, but will include additional safety and maintenance activities. Thus, impacts on transportation services that have occurred during operations will continue during the LR term. At all case-study sites, generally SMALL impacts on transportation infrastructure and services are projected to continue.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of transportation impacts from operations during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 (c) with respect to analysis of socioeconomic data
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to SEIS contents
- 10 CFR 51.95(c)(4) with respect to SEIS contents and consideration of Category 2 issues
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 4.4.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), contains guidance to the applicant concerning the analysis of potential transportation impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts of operations during the renewal term station operations.

Technical Rationale

The technical rationale for evaluating the applicant's potential transportation impacts is discussed in the following paragraphs:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant

new information in an environmental impact statement (EIS) prepared at the license renewal stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to impacts of plant operations on transportation during the renewal term, as appropriate..

It is explicitly required by 10 CFR 51, Subpart A, Appendix B, that transportation impacts of operations during the renewal term be considered in LR (64 FR 48496). This is because impacts can usually be judged primarily from local road conditions existing at the time of the project at a particular site and cannot be easily forecasted generically. A site-specific review will be necessary to determine whether impacts are likely to be SMALL or MODERATE and whether mitigation measures may be warranted.

III. REVIEW PROCEDURES

To analyze the impact of plant operations during the renewal term on transportation, the reviewer should complete the following steps:

- (1) Review the discussion of potential impacts of operations during the renewal term on transportation in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain site-specific information for evaluation. The following sources of information should be included in the search for information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of license renewal of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovery of new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the full scope of transportation impacts, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

Generally, operating impacts will be less than the corresponding impacts of refurbishment. It is not necessary to re-address impacts determined to be minor by the reviewer for ESRP/S1 3.6.5.

NUREG-1437 states that impacts on transportation during the renewal term would be similar to those experienced during current operations and would be driven mainly by the workers involved in current plant operations. Transportation impacts would continue to be of SMALL significance at all sites during operations and would be of SMALL or MODERATE significance during scheduled refueling and maintenance outages.

If, based on this analysis, the reviewer determines that there will be impacts on transportation, proceed to Step (4). Otherwise, if the reviewer determines that there will be no impacts on transportation or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the transportation system impacts associated with operations during the renewal term, as follows:

- Determine the operating-staff requirements by predicting the number of workers originating from within the region and the number of daily commuters. Certain characteristics of the LR term work force (e.g., percentage residing in the study area, percentage moving into the study area, percentage of in-migrants accompanied by families) ordinarily can be assumed to be similar to those of the current plant staff.
- Predict the geographic distribution of in-migrants (for commuting patterns).
- Estimate the overall impact of in-migrants on regional employment and population.
- Estimate the effects of in-migrants and induced economic activity on transportation demand, especially along routes that are at or near capacity and routes that are expected to receive increases in demand due to activity at the plant.

(5) Describe any unique changes predicted to occur in communities surrounding the plant with respect to residential choices and transportation infrastructure and describe the mechanisms available to these communities to plan for and accommodate changes induced by plant operations during the renewal term.

Data provided in the applicant's ER are adequate if they describe

- the degree to which local transportation services are likely to be affected by plant operations during the renewal term, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such transportation impacts. NUREG-1437 states that the significance of transportation impacts is related to the Transportation Research Board's LOS definitions. LOS is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. Using LOS data describing existing conditions, it will be necessary to project LOS conditions that would arise from the additional traffic associated with refurbishment during shift change times when plant- and non-plant related traffic is heaviest. A general definition of each LOS is provided below.

NUREG-1437 states that LOS A and B are associated with SMALL impacts because the operation of individual users is not substantially affected by the presence of other users. At this level, no delays occur and no improvements are needed. LOS C and D are associated with MODERATE impacts because the operation of individual users begins to be severely restricted by other users, and at level D, small increases in traffic cause operational problems. Consequently, upgrading of roads or additional control systems may be required. LOS E and F

are associated with LARGE impacts because the use of the roadway is at or above capacity level, causing breakdowns in flow that result in long traffic delays and a potential increase in accident rates. Major renovations of existing roads or additional roads may be needed to accommodate the traffic flow.

- any mitigative measures for which credit is being taken to reduce transportation system concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of transportation impacts.

(6) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.

(7) Based on the results of the assessments listed above, prepare the following for the SEIS:

- a brief description of pathways by which the workforce required during operations in the renewal term may interact with the regional transportation system to result in MODERATE or LARGE impacts
- a statement (qualitative or quantitative, as appropriate) about the degree to which regional transportation infrastructure and services are expected to receive impacts, together with the significance of these impacts
- a discussion of the reasoning (e.g., based on freight-transportation requirements to the plant site, locations of numbers of in-migrants, impacts on population, location, and transportation routes, facilities, and services) behind the estimated degree of impact
- a discussion of any mitigative measures for which credit is being taken to reduce transportation infrastructure and service concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of renewal term operations on transportation. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts during the renewal term, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that the transportation system will not experience impacts as a result of operations during the renewal term.

If the reviewer determines that there will be a discernible effect as a result of operations during the renewal term, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to the local transportation system. Based on this review, the staff concludes that the impact is SMALL, and mitigation is not warranted.

The staff has reviewed the available information relative to local transportation system. Based on this review, the staff concludes that the impact is MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to local transportation system. Based on this review, the staff concludes that the impact is LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement -- general."

10 CFR 51.71, "Draft environmental impact statement -- contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

64 FR 48496. September 3, 1999. Changes to Requirements for Renewal of Nuclear Power Plant Operating Licenses. *Federal Register*.

Transportation Research Board. 1985. *Highway Capacity Manual*, Special Report 209, National Research Council, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.4.5 HISTORIC AND ARCHAEOLOGICAL RESOURCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of potential impacts on historic and archaeological resources during the renewal term. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Statement for License Renewal of Nuclear Plants* (NRC 1996a), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(K) to address the issue in its environmental report (ER).

The scope of the review directed by this plan includes (1) an analysis of the effects of plant operations during the renewal term on historic and archaeological resources in sufficient detail to allow the reviewer to predict the potential for impacts on these resources and evaluate the significance of such impacts and (2) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1s 2.1 and 2.2.6. Obtain a detailed description of the proposed plant LR term operations.
- ESRP/S1 3.1. Obtain description of onsite land use.
- ESRP/S1 4.7. Obtain descriptions of any new and significant information related to LR term operations.

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 4.8. Provide a summary of any impacts on historic or archeological resources from operation
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. The following information may be needed:

- a copy of the site map that identifies the areas of potential effects if historical and archaeological resources were to be found
- information on previous cultural resources surveys that have identified historic and archaeological resources, along with site-specific locations for those resources that are either located in or near the areas of potential effects
- information related to past evaluations of known historic and archaeological resources per significance criteria for eligibility for the “National Register of Historic Places” (36 CFR 60), and associated consultations with the State Historic Preservation Officer (SHPO), local preservation officials, or Native American tribal officials.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of historic and archaeological resources impacts during the renewal term are based on the relevant requirements of the following regulation:

- 10 CFR 51.53 (c)(3)(ii)(K) requires all applicants to assess whether any historic or archaeological properties will be affected by the proposed project.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for license renewal.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.3, 3.6.2, and 5.8.2 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with license renewal.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), contains guidance to the applicant concerning the analysis of potential impacts to historic and archaeological resources. The reviewer should ensure that the applicant’s analysis is sufficient to evaluate impacts on such resources during refurbishment.

- Nuclear Reactor Regulation (NRR) Office Letter No. 906, Revision 1 (NRC 1996b), which includes guidance for complying with the requirements combined in the National Historic Preservation Act (NHPA) pertaining to protection and preservation of significant historic properties during operation of the plant. NRR Office Letter No. 906 is revised periodically. Obtain a copy of the latest revision for current guidance.

Technical Rationale

The technical rationale for evaluating the applicant's potential historic and archaeological impacts is discussed in the following paragraphs:

It is required by 10 CFR 51, other NRC regulations, and relevant historic laws and regulations (specifically the National Historic Preservation Act of 1966, as amended, and 36 CFR 800) that the agency and applicant consider potential impacts on historic and archaeological resources that are eligible for listing on the National Register of Historic Places.

The purpose of the historic and archaeological resources assessment is to ensure that such resources that are considered eligible for inclusion in the National Register of Historic Places are not adversely affected by proposed activities related to renewal term operations. Historic and archaeological resources may include prehistoric or historic archaeological sites, historic properties, districts, and landscapes, as well as traditional cultural properties that may have significance for Native American tribes.

III. REVIEW PROCEDURES

To analyze the impact of plant operations during the renewal term on historic and archaeological resources, the reviewer should complete the following steps:

- (1) Review the discussion of the impacts of plant operations during the renewal term on historic and archaeological resources in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Determine, from the full scope and location of the proposed operations, impacts, along with an assessment of whether the potential impacts will be considered to be SMALL, MODERATE, or LARGE.
 - Impacts will be considered SMALL if (1) there are no significant resources on or near the site, or (2) there are no significant historic or archaeological resources but they would not be adversely affected by onsite or offsite plant operations activities, and (3) if conditions associated with moderate impacts do not occur.
 - Impacts will be considered MODERATE if historic and archaeological resources, are thought by either local historians, archaeologists, or Native American tribal members to have local significance and would contribute substantially to an area's sense of historic or traditional character.

- Impacts are considered to be **LARGE** if resources that have significant historic or archaeological value would be disturbed or otherwise would have their historic character altered through operations activities.

It is unlikely that impacts considered to be either **MODERATE** or **LARGE** to historic and archaeological resources will occur at any site unless new facilities or service roads are constructed or new transmission lines are established.

(3) Analyze the historic and archaeological resources impacts associated with the operations during the renewal term, as follows:

- Determine the direct and indirect impacts that could result from plant related construction activities during refurbishment or the LR term, e.g., building new waste storage facilities, new parking areas, new access roads to existing transmission lines, or new transmission lines. Direct impacts could occur from construction or ground disturbing actions. Indirect impacts could occur from an increased workforce, which increases the potential for intentional or inadvertent impacts such as illegal artifact collecting from historic and archaeological resources located in close proximity to work areas.
- Identify the geographic distribution of new development and potential effects if historic or archaeological resources were found. As part of this analysis, an evaluation of past surface-disturbing activities that might have previously impacted or destroyed historic and archaeological resources should be conducted.
- Identify all known historic and archaeological resources that may be either directly or indirectly affected from the proposed onsite or offsite actions on a copy of the site map showing areas of potential effects from operations during the renewal term.

(4) Evaluate the potential effects from operations activities to known historic and archaeological sites by comparing the location and significance evaluation for individual resources to areas of potential effect from project activities. If historic and archaeological resources are found to be in or near areas of potential effects, the assessment of effects can be conducted using criteria for effect and adverse effect contained in 36 CFR 800.9. Assessments of effect should involve the SHPO, local historic preservation officials, and Native American tribal members, as necessary, to ensure that all potential values are identified for specific resources. The assessment will result in one of the following conclusions:

- No effect; the proposed license-renewal-term operations activities will not affect any known significant historic and archaeological resources.
- No adverse effect; the activities will affect one or more historic or archaeological resources, but the effect will not significantly alter the historic character of the resource(s).
- Adverse effect; the proposed activities will result in harm to the qualities that make one or more historic or archaeological resource significant.

- (5) If an adverse effect will result from the proposed LR term operations activities, the applicant, in consultation with the SHPO, Native American tribes, and other interested parties should identify strategies to mitigate the impacts to significant historic and archaeological resources.

IV. EVALUATION FINDINGS

The depth and extent of the information in the assessment will be governed by the extent and significance of the effects of operations during the renewal term on historic and archaeological resources. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the assessment, as appropriate.

If the reviewer concludes there are no historic or archaeological resources, a statement similar to the following:

Based on review of the information provided by the applicant, the staff finds that no historic or archaeological resources are present.

If the reviewer concludes that there will be no impacts during the renewal term, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that historic and archaeological resources will not experience impacts as a result of activities during renewal term operations during the renewal term.

If the reviewer determines that there will be a discernible effect as a result of operations during the renewal term, a statement for the analysis should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to historic and archaeological resources. Based on this review, the staff concludes that the impact to these resources is **SMALL**, and mitigation is not warranted.

The staff has reviewed the available information relative to historic and archaeological resources. Based on this review, the staff concludes that the impact is **MODERATE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **MODERATE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to historic and archaeological resources. Based on this review, the staff concludes that the impact is **LARGE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

36 CFR 60, "National Register of Historic Places, National Parks Service, Department of the Interior."

36 CFR 800, "Protection of Historic Properties."

National Historic Preservation Act, as amended, 16 USC 470 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1996a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission, NRR Office Letter No. 906, Rev. 1. 1996b. "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues," Office of Nuclear Reactor Regulation, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.4.6 ENVIRONMENTAL JUSTICE IMPACTS DURING OPERATIONS

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of environmental justice for operations during the renewal term. Environmental justice was not addressed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996a), and therefore is being treated equivalent to a Category 2 issue in Table B-1 of Appendix B, Subpart A to 10 CFR 51. The 10 CFR 51.53(c)(3)(ii) does not address this issue directly as a required analysis by the applicant. Guidelines for specific information requirements for environmental justice determinations are described in Attachment 4 to NRR Office Letter No. 906, Revision 1: "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues" (NRC 1996b). This office letter is revised periodically. For current guidance, obtain the latest revision.

The scope of the review directed by this plan should include an analysis of impacts on minority and low-income populations, the location and significance of any environmental impacts of operations during the renewal term on populations that are particularly sensitive, and any additional information pertaining to mitigation. The descriptions to be provided by this review should be of sufficient detail to permit subsequent staff assessment and evaluation of specific impacts, in particular whether these impacts are likely to be negative and disproportionate, and to evaluate the significance of such impacts.

If an environmental impact statement (EIS) has been prepared for the plant that includes environmental justice and if there is no new and significant information, it may be possible to reference or adapt the previous analysis to the proposed license renewal (LR) action.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.1. Obtain descriptions of power transmission systems and operations.
- ESRP/S1 2.2.8. Obtain descriptions of the minority and low-income populations that could be disproportionately impacted by proposed project operations and the mechanisms (including socioeconomic) by which disproportionate harm could occur.
- ESRP/S1s 4.1 through 4.7. Obtain descriptions of potential environmental and socioeconomic (CEQ 1997) impacts, and any new and significant information related to operations.
- ESRP/S1 3.6.7. Obtain a summary of any environmental justice impacts during refurbishment. Provide a summary of any environmental justice impacts of operations during the renewal term operations, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.8. Provide a summary of any environmental justice impacts, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.
- ESRP/S1s 5.1 and 5.2. Obtain descriptions of potential plant accidents, risk, and impact.
- ESRP/S1 8.2. If the reviewer concludes that proposed operations will result in disproportionate adverse impacts on minority or low-income populations that should be avoided, then provide a request to the reviewers for ESRP/S1 8.2 to consider alternative energy sources that would avoid the impacts.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of the potential impact. For potential consideration as an impact pathway, ordinarily it is necessary that an impact extend beyond the site boundary; that is, it must affect offsite human populations. The following data or information may be needed:

- information on the potential environmental pathways that have any impact on human populations beyond the site boundary

- information on geographical distribution and customs, practices, and dependencies of minority and low-income populations. These populations may be present in scattered small groups or may have unusual customs, practices, or dependencies on specific resources that would be overlooked in a broader analysis that focuses on the majority population.^(a)

Demographic data are available from Geographical, Environmental & Siting Information System (GEn&SIS) or from the Bureau of the Census block data and TIGER files, supplemented by any information on particular groups obtained from the scoping process and contacts with minority and low-income communities. The latter are also a good source for data concerning unusual customs, practices, and resource dependencies.

II. ACCEPTANCE CRITERIA

The acceptance criteria for environmental justice impacts are based on the relevant requirements of the following:

- 10 CFR 51.45 provides guidance with respect to analysis of socioeconomic data.
- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.
- Executive Order 12898 (59 FR 7629) provides guidance with respect to Federal actions to address environmental justice in minority and low-income populations.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to treatment of Category 2 issues for LR.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance on reviewing ERs associated with license applications under 10 CFR 50 and 52. ESRPs 2.5.4, 4.4.3, and 5.8.3 contain review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), contains guidance to

(a) An example of unusual practices can be found at the Louisiana Energy Services Claiborne Enrichment Center application (NRC 1998) where proposed relocation of a road between two settlements could have disproportionately and adversely affected minority and low-income individuals who ordinarily walked between the two settlements.

the applicant concerning the analysis of potential environmental justice impacts. The reviewer should ensure that the applicant's analysis is sufficient to evaluate impacts of operation during the renewal term.

- Council on Environmental Quality guidance for addressing environmental justice, *Environmental Justice: Guidance Under the National Environmental Policy Act*, CEQ Guidance December 10, 1997 (CEQ 1997).
- Guidelines for specific information requirements for environmental justice determinations are described in Attachment 4 to NRR Office Letter No. 906, Revision 1: "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues" (NRC/NRR 1996). NRR Office Letter No. 906 is revised periodically. Obtain a copy of the latest revision for current guidance.

Technical Rationale

The technical rationale for evaluating the impacts of the proposed action on environmental justice is discussed in the following paragraphs:

It is explicitly required by 10 CFR 51, Subpart A, Appendix B, that environmental justice be considered in LR. The memorandum accompanying Executive Order 12898 directs Federal agencies to consider environmental justice as part of the National Environmental Policy Act (NEPA) process. Although NRC is an independent agency, it has stated its intent to comply with the Executive Order.

The purpose of the environmental justice assessment is to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects on minority and low-income populations. These populations may be present in scattered small groups, or may have unusual customs, practices, or dependencies on specific resources that would be overlooked in a broader analysis that focuses on the majority population. As a result, it is necessary to evaluate impacts for each such population and more carefully examine unusual environmental and socioeconomic pathways and dependencies that could result in disproportionately high impacts on them.

III. REVIEW PROCEDURES

The kinds of data and information required will be affected by site- and station-specific factors, and the level of detail should be scaled according to the anticipated magnitude of the potential impact. The data requirements analysis should generally be the same for any type of environmental review that requires the preparation of an ER. Ordinarily, an environmental justice assessment would not be required for environmental impacts that remain within the plant boundary, or for environmental impacts that do not directly or indirectly affect offsite human populations. The review procedure should be as follows:

- (1) Determine which impacts are likely to be of concern and, therefore, what environmental impact issues should be discussed:
 - Contact the reviewers for ESRP/S1s 4.1 through 4.7 to determine whether the appropriate impact issues are being discussed.
 - Contact the reviewers for ESRP/S1s 5.1 and 5.2 to obtain a description of potential accidents, together with their associated risks and impacts.
- (2) Examine the record of the public scoping process to determine whether appropriate environmental impact issues are being discussed with respect to environmental justice.
- (3) Contact the responsible personnel of the State for information available in that state concerning locations, customs, practices, and resource dependencies of minority and low-income populations. For sites located on or near State boundaries, or where transmission line routes, access corridors, or offsite areas pass through more than one State, contact the responsible personnel of each affected State.

If, based on Steps (1) through (3), the reviewer determines that the environmental impacts extend past the plant boundaries and directly or indirectly affect human populations, then proceed with the analysis at Step (4). Otherwise, prepare a statement for the supplemental environmental impact statement (SEIS) to the effect that no environmental impact will adversely and disproportionately affect minority or low-income populations. An example is shown in Evaluation Findings.

- (4) If the environmental impacts either directly or indirectly affect human populations, then perform the following assessments (or review those provided by the applicant):
 - an assessment (qualitative or quantitative, as appropriate) of the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental impacts of operations during the renewal term as compared to the population of the entire geographic area
 - an assessment (qualitative or quantitative, as appropriate) of the significance or potential significance of such environmental impacts on each minority and low-income population. Significance is determined by considering the disproportionate exposure, multiple-hazard conditions, and cumulative-hazard conditions outlined in *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ 1997)
 - an assessment of the degree to which each minority and low-income population is disproportionately receiving any benefits compared to the entire geographic area.

Data provided in the applicant's ER are adequate if they describe or consider

- the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental impacts during operations as compared to the entire geographic area, and these data are in agreement with data obtained from other sources, when available
- the significance or potential significance of such environmental impacts on each minority and low-income population
- the degree to which each minority or low-income population is disproportionately receiving any benefits of operations during the renewal term in comparison to the entire geographic area
- any mitigative measures for which credit is being taken to reduce environmental justice concerns
- the unique lifestyles and practices of minority and low-income communities (for example, subsistence activities or dependence on specific water supplies) that could result in disproportionate impacts of operations during the renewal term.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of minority and low-income populations.

- (5) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the disproportionate adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (6) Based on the results of the assessments listed above, prepare the following for the SEIS:
 - a brief description of pathways by which any environmental impact of operations during the renewal term may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low-income populations
 - a statement (qualitative or quantitative, as appropriate) about the degree to which each minority or low-income population is disproportionately receiving adverse human health or environmental impacts of operations during the renewal term as compared to the entire geographic area, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on locations of minority and low-income populations and the environmental pathways described in ESRP/S1 2.3) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit is being taken to reduce environmental-justice concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the identified minority and low-income populations and by the nature and magnitude of the expected impacts of operation during the renewal term. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no disproportionately high and adverse impacts of operation during the renewal term, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that no minority or low-income group will experience disproportionately high and adverse environmental impacts as a result of operations during the renewal term.

If the reviewer determines that there will be a disproportionately high and adverse environmental impact on some minority or low-income population as a result of activities during operations, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows:

The staff has reviewed the available information relative to environmental justice. Based on this review, the staff concludes that the impact is **SMALL**, and mitigation is not warranted.

The staff has reviewed the available information relative to environmental justice. Based on this review, the staff concludes that the impact of (list) is **MODERATE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **MODERATE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated....

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

The staff has reviewed the available information relative to environmental justice. Based on this review, the staff concludes that the impact of (list) is **LARGE**.

(The statement should then briefly summarize the reasoning by which impacts have been identified as **LARGE**.)

The statement should then continue:

The following mitigation measures have been identified, considered, and evaluated...

(Potential mitigation by specific design or procedure modification should then be identified, considered, and evaluated.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

Council on Environmental Quality (CEQ). 1997. *Environmental Justice: Guidance Under the National Environmental Policy Act*. CEQ Guidance, December 10, 1997, Washington, D.C.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations." 59 *Federal Register* 7629-7633 (1994).

U.S. Nuclear Regulatory Commission (NRC). 1996a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (NRC/NRR). 1996b. "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues." NRR Office Letter No. 906, Revision 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. In the Matter of Louisiana Energy Services Claiborne Enrichment Center. Docket 70-3070-ML. CLI-98-3. Washington, D.C. April 3, 1998.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.5 GROUNDWATER-USE AND QUALITY

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of impacts of operation during the renewal term on groundwater-use and quality. These potential impacts during the renewal term were evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts in NUREG 1437, (2) identification of new information related to potential impacts of operation during the LR term on groundwater-use and quality and evaluation for significance, (3) preparation of input to the supplemental environmental impact statement (SEIS) that disposes the Category 1 issues related to cooling groundwater-use and quality, and (4) preparation of input to the SEIS that introduces the SEIS sections covering the Category 2 issues.

Potential impacts of operation during the renewal term related to groundwater-use

- conflicts (potable and service water > 100 gpm)
- conflicts (cooling tower makeup water)
- conflicts (Ranney wells)
- quality degradation (cooling ponds at inland sites)

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

are identified as Category 2 issues in NUREG-1437 and Table B-1 of Appendix B, Subpart A to 10 CFR 51. The plant-specific reviews of these issues required by 10 CFR 51.53(c)(3)(ii)(A), 10 CFR 51.53(c)(3)(ii)(C), and 10 CFR 51.53(c)(3)(ii)(D) are addressed specifically in supplemental ESRPs (ESRP/S1s) 4.5.1 through 4.5.4.

Review Interfaces

The reviewer should obtain input from or provide input to the reviewers of information covered by the following supplemental ESRPs:

- ESRP/S1s 4.5.1 through 4.5.4. Obtain lists of issues for which there is significant new information.
- ESRP/S1 4.7. Provide a list of the issues for which there is significant new information.
- ESRP/S1 4.8. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information (from the environmental report [ER])
- any new information included in the ER on the groundwater-use and quality issues known to the applicant
- new and potentially significant information on groundwater-use and quality issues identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of groundwater-use and quality issues are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(b) with respect to independent evaluation and responsibility for the reliability of information used in the draft environmental impact statement (EIS)
- 10 CFR 51.71(d) with respect to (1) compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal

agencies, including applicable zoning and land use regulations and (2) analysis of Category 2 issues (Zoning and land use regulations may be governed by the availability of potable groundwater resources.)

- 10 CFR 51.95(c)(4) with respect to SEIS content and consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999a), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the impacts of operation on groundwater-use and quality is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2 information developed for those open Category 2 issues applicable to the plant, and any significant new information. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to groundwater-use and quality during the LR term, as appropriate, and addresses significant new information, if any.

III. REVIEW PROCEDURES

The review of potential cooling system impacts during the LR term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of groundwater-use and quality issues in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The Category 1 issues identified in NUREG-1437 are listed in the following table:

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|--|----------|------------------------|
| GROUNDWATER-USE AND QUALITY | | |
| Ground-water use conflicts (potable and service water, and dewatering; plants that use <100 gpm) | 1 | 4.8.1.1 4.8.1.2 |
| Ground-water quality degradation (Ranney wells) | 1 | 4.8.2.2 |
| Ground-water quality degradation (saltwater intrusion) | 1 | 4.8.2.1 |
| Ground-water quality degradation (cooling ponds in salt marshes) | 1 | 4.8.3 |

(2) Determine if there is new information that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- land-use or air-quality regulations affecting cooling systems. Have there been changes in regulations of governmental agencies that affect cooling systems since the plant was constructed? If so, do the changes affect NRC's evaluation of the LR application?

If the search conducted in this step reveals new information, continue with Step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is no new information, and adopting the conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, continue with Steps (4) and (5) of the review. Otherwise, prepare the section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437.

- (4) Prepare a concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Program Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437, modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in SEIS Section 4.7 for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be determined by the analysis required to reach a conclusion related to potential impacts on groundwater-use and quality of operation during the LR term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Ground-water quality degradation (Ranney wells): Based on information in the GEIS, the Commission found that

“Ground-water 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 ground water and is not expected to be a problem during the license renewal term .”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS,^(a) or its evaluation of other available information, including reports of studies of the _____ performed for the _____. Therefore, the staff concludes that there are no impacts of Ranney wells on ground-water quality degradation during the renewal term beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Ground-water quality degradation (Ranney wells): Based on information in the GEIS, the Commission found that

-
- (a) Include this phrase only in the final SEIS.

“Ground-water 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 ground water and is not expected to be a problem during the license renewal term .”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to the impact of Ranney wells on ground-water quality has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of Ranney wells on ground-water quality during the renewal term beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Ground-water quality degradation (Ranney wells): Based on information in the GEIS, the Commission found that

“Ground-water 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 ground water and is not expected to be a problem during the license renewal term .”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(c), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to the impact of Ranney wells on ground-water quality has been identified

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 4.7.1, 4.7.2, etc.])

The staff has determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant

(b) Include this phrase only in the final SEIS.
(c) Include this phrase only in the final SEIS.

new information, there are no impacts of Ranney wells on ground-water quality during the renewal term beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Supplement to final environmental impact statement."

10 CFR 51 Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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4.5.1 GROUNDWATER-USE CONFLICTS (POTABLE AND SERVICE WATER)

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the potential groundwater water-use conflicts at plants pumping more than 100 gpm for potable and service water and operational dewatering. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant is required by 10 CFR 51.53(c)(3)(ii)(c) to address the issue in its environmental report (ER), if the plant pumps more than 100 gpm.

The scope of the review directed by this plan includes (1) review of the discussion of the issue in NUREG-1437, (2) evaluation of the data and analysis in the applicant's ER, (3) independent analysis and evaluation of the data, if appropriate, and (4) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.2.1. Obtain a description of the plant location and the location of local aquifers.
- ESRP/S1 2.3.2. Obtain descriptions of groundwater use by the plant and other users near the plant.

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4.5.1-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 4.8. Provide a summary of the analysis performed and conclusion reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- descriptions of the site and local groundwater aquifers including geohydrologic characterization data (from the ER and ESRP/S1 2.2.1)
- descriptions of the spatial and seasonal changes in water table elevation and pumpage rates for wells both inside and outside the site boundary (from the ER)
- descriptions of any currently employed or proposed practices and measures to control or limit operational water-use impacts (from the ER)
- descriptions of Federal, State, regional, local, and affected Native American tribal agencies' standards and regulations applicable to groundwater use (from consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- descriptions of proposed means to ensure operational compliance with water-quality and water-use standards and regulations (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of water-use impacts at the plant's site are based on the relevant requirements of the following:

- 40 CFR 149 with respect to possible supplemental restrictions on water use in or above a sole source aquifer
- Federal, State, regional, local, and affected Native American tribal agencies' water laws and water rights
- 10 CFR 51 Subpart A, Appendix B, Table B-1, with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance with respect to the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.
- In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the U.S. Supreme Court granted the States additional authority to limit hydrological alterations beyond the States' role in regulating water rights. As a result of this ruling, the States may regulate the quantity of water as a part of the definition of water quality.

Technical Rationale

The technical rationale for evaluating the applicant's potential water-use impacts is discussed in the following paragraph:

According to the analysis in NUREG-1437, groundwater water-use conflicts with nearby groundwater users at plants pumping more than 100 gpm for potable and service water and operational dewatering may be SMALL, MODERATE, or LARGE. The SEIS should include an analysis that considers the potential of groundwater water-use conflicts for plants pumping more than 100 gpm.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of cooling tower or cooling pond makeup-water withdrawals on local aquatic and terrestrial ecosystems. Suggested steps for the review process are as follows:

- (1) Review the discussion of the potential for groundwater water-use conflicts with nearby groundwater users at plants pumping more than 100 gpm for potable and service water and operational dewatering in the NUREG-1437.
- (2) Determine the seasonal groundwater pumpage needs for the plant. If any season has an average groundwater pumpage of greater than 100 gpm, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS that describes the plant's groundwater use and concludes that there

are no impacts resulting from groundwater pumpage for potable and service water and operational dewatering.

- (3) Determine the extent of the influence of the plant's well(s) predicted by either standard analytic approaches or numerical models. Steady-state analytic approaches can be used with the maximum seasonal pumping rates. Numerical models can be used either with the maximum pumping rate to estimate steady-state drawdown or with the average seasonal pumping rates for a transient simulation of the drawdown. Model results should be validated with any piezometer observations. Possible impacts on predictions from heterogeneous aquifer parameters, particularly stratigraphy, should be considered. If the extent of the cone of depression caused by the plant's well(s) extends beyond the site's boundary, then continue the analysis at Step (4). Otherwise, prepare a statement for the SEIS that describes the plant's groundwater water use and concludes that there are no impacts resulting from groundwater pumpage for potable and service water and operational dewatering.
- (4) Determine the magnitude of the reduction in yield resulting from the plant's pumpage predicted by numerical procedures. If the drawdown extends beyond the site boundary and into a zone influenced by other wells, then continue the analysis with Step (5). Otherwise, prepare a statement for the SEIS that describes the plant's groundwater water use and concludes that there are no impacts resulting from groundwater pumpage for potable and service water and operational dewatering.
- (5) Estimate the reduction in yield caused by the plant's pumpage. Based on the magnitude of the reduction in yield, define the impact as SMALL, MODERATE, or LARGE. If the impacts are MODERATE or LARGE, evaluate potential mitigation measures. Then, prepare a statement for the SEIS that describes the plant's groundwater water use, the impacts, and mitigation measures, and concludes that the impacts are SMALL, MODERATE, or LARGE, as appropriate.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of makeup water for cooling towers and cooling ponds. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

The applicant has stated that the reduction in yield of nearby groundwater users' wells resulting from the plant's pumping for potable and service water and operational dewatering does not reduce the yield of groundwater of other water users' wells that share the same aquifer as a source of water. The staff did not find any information to the contrary in its independent review or in comments made in public meetings or correspondence related to the application. Therefore, the staff concludes that the plant's groundwater pumpage will have no impact on the nearby groundwater users.

The applicant has stated that the reduction in yield of nearby groundwater users' wells resulting from the plant's pumping for potable and service water and operational dewatering does not significantly reduce the yield of groundwater of other water users' wells that share the same aquifer as a source of water. The staff did not find any information to the contrary in its independent review or in comments made in public meetings or correspondence related to the application. Therefore, the staff concludes that the plant's groundwater pumpage will have a SMALL impact on the nearby groundwater users.

The applicant has stated that the reduction in yield of nearby groundwater users' wells resulting from the plant's pumping for potable and service water and operational dewatering significantly reduces the yield of groundwater of other water users' wells that share the same aquifer as a source of water. The applicant has committed to mitigating any impacts the reduce groundwater yield by _____. (For example, by installing groundwater recharge using treated waste-water effluent to increase the seasonal yield of the aquifer.) Therefore, the staff concludes that the plant's groundwater pumpage will have a (MODERATE or LARGE) impact on the nearby groundwater users.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 149, "Sole Source Aquifers."

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.5.2 GROUNDWATER-USE CONFLICTS (COOLING TOWER MAKEUP WATER)

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of groundwater-use conflicts resulting from surface-water withdrawals from small water bodies during low-flow conditions. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant is required by 10 CFR 51.53(c)(3)(ii)(A) to address this issue in its environmental report (ER) if the plant uses cooling towers.

The scope of the review directed by this plan includes (1) review of the discussion of the issue in NUREG-1437, (2) evaluation of the data and analysis in the applicant's ER, (3) independent analysis and evaluation of the data, if appropriate, and (4) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.2.1. Obtain a description of the plant location and location of local aquifers and surface

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NUREG-1555, Supplement 1

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

water bodies.

- ESRP/S1 2.2.3. Obtain descriptions of cooling tower and cooling pond seasonal makeup water requirements.
- ESRP/S1 2.3.2. Obtain descriptions of water use of other users near the plant.
- ESRP/S1 4.8. Provide a summary of the analysis performed and conclusion reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- descriptions of the site, the affected river, and the local groundwater aquifers, including geohydrologic characterization data (from the ER and ESRP/S1 2.2.1)
- descriptions of the spatial and seasonal changes in water table elevation, surface withdrawals, groundwater withdrawals, stream stage height for the river, and the aquifer in hydraulic connection to the river (from the ER)
- descriptions of any currently employed or proposed practices and measures to control or limit operational water-use impacts (from the ER)
- descriptions of Federal, State, regional, local, and affected Native American tribal agencies' standards and regulations applicable to groundwater and surface-water use (from consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- descriptions of proposed means to ensure operational compliance with water-use permits, standards, and regulations (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of water-use impacts at the plant's site are based on the relevant requirements of the following regulations:

- 40 CFR 149 with respect to possible supplemental restrictions on water use in or above a sole source aquifer

- Federal, State, regional, local, and affected Native American tribal agencies' water laws and water rights.
- 10 CFR 51 Subpart A, Appendix B, Table B-1 with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance as to the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.
- In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the U.S. Supreme Court granted the States additional authority to limit hydrological alterations beyond the States' role in regulating water rights. As a result of this ruling, the States may regulate the quantity of water as a part of the definition of water quality.

Technical Rationale

The technical rationale for evaluating the applicant's potential groundwater-use impacts is discussed in the following paragraph:

According to the analysis in NUREG-1437, groundwater water-use conflicts with nearby groundwater users resulting from surface-water withdrawals from small water bodies during low-flow conditions that may affect aquifer recharge, especially if other groundwater or upstream surface-water users come online before the time of LR, may be a SMALL, MODERATE, or LARGE impact. The SEIS should include an analysis that considers this potential for groundwater use conflicts for plants using small water bodies to provide makeup water for cooling towers.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of cooling tower makeup water withdrawals on local groundwater uses. Suggested steps for the review process are as follows:

- (1) Review the discussion in NUREG-1437 of potential groundwater water-use conflicts resulting from surface-water withdrawals from small water bodies during low-flow conditions that may affect aquifer recharge.
- (2) Determine whether the river used for makeup water supply is over subscribed (i.e., the demand for water exceeds supply) during any season. Water-use permits often include specific restrictions on withdrawals during certain low-flow conditions. If the basin is over subscribed, continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS that describes the plant's cooling- tower makeup-water use and concludes that there are no impacts to groundwater users resulting from makeup-water withdrawals.
- (3) Determine whether the river recharges the aquifer or the aquifer discharges into the river. If the aquifer consistently discharges to the river, then groundwater withdrawals will not be impacted by changes in river flow, whereas the river flows will be impacted by the groundwater withdrawals, although often not significantly. If the aquifer is consistently recharged by the river, then groundwater withdrawals will be impacted by changes in river flow, whereas the river flow will not be significantly impacted by the groundwater withdrawals. Often the direction of water transfer between rivers and their associated aquifers alternates back and forth as one moves downstream. By comparing the piezometer data from the affected aquifer with the river stage height data, the direction of flow can be determined. If the aquifer does not consistently discharge into the river downstream from the makeup water withdrawal location, continue the analysis at Step (4). Otherwise, prepare a statement for the SEIS that describes the plant's cooling-tower makeup-water use and concludes that there are no impacts to groundwater users resulting from makeup-water withdrawals.
- (4) Determine the magnitude of the reduction in groundwater yield resulting from the plant's cooling tower makeup water withdrawal. Estimating the magnitude of the reduction of groundwater yield generally requires application of analytic or numerical models. Only those wells located in areas downstream from the makeup water diversion whose contributing area includes recharge from the river need be considered. Sensitivity analyses should be included on the parameters governing the exchange of water between the river and the aquifer. Based on the magnitude of the reduction in yield, the impact will be SMALL, MODERATE, or LARGE. If the impacts are MODERATE or LARGE, then continue with Step (5). Otherwise, prepare a statement for the SEIS that concludes that the impacts will be SMALL.

- (5) Identify and evaluate potential mitigation measures. Then, prepare a statement for the SEIS that concludes that the impacts after appropriate mitigation measures are SMALL, MODERATE, or LARGE.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of makeup water for cooling towers and cooling ponds. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

The applicant has stated that the yield of groundwater users' wells is not affected by makeup-water withdrawals for the plant's cooling towers. The staff did not find any information to the contrary. Therefore, the staff concludes that the plant's withdrawals of makeup water for cooling tower operation will have no impact on the nearby groundwater users.

The applicant has stated that the yield of groundwater users' wells is not significantly affected by makeup water withdrawals for the plant's cooling towers. The staff did not find any information to the contrary. Therefore, the staff concludes that the plant's withdrawals of makeup water for cooling tower operation will have a SMALL impact on the nearby groundwater users.

The applicant has stated that the yield of groundwater users' wells is significantly affected by makeup water withdrawals for the plant's cooling towers. The applicant has committed to mitigating any impacts the reduce groundwater yield by installing groundwater recharge off-stream storage to allow the plant to operate for extended periods during the low-flow season with only 50% of the plant's normal makeup-water diversions. Therefore, the staff concludes that the plant's withdrawals of makeup water for cooling tower operation will have a (MODERATE or LARGE) impact on the nearby groundwater users.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 149, "Sole Source Aquifers."

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.5.3 GROUNDWATER-USE CONFLICTS (RANNEY WELLS)

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the potential for groundwater-use conflicts with nearby groundwater users at plants using Ranney wells. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant is required by 10 CFR 51.53(c)(3)(ii)(C) to address this issue in its environmental report (ER) if the plant uses Ranney Wells.

The scope of the review directed by this plan includes (1) review of the discussion of the issue in NUREG-1437, (2) evaluation of the data and analysis in the applicant's ER, (3) independent analysis and evaluation of the data, if appropriate, and (4) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 2.2.1. Obtain a description of the plant location and location of local aquifers.

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4.5.3-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.3.2. Obtain descriptions of groundwater use by the plant and other users near the plant.
- ESRP/S1 4.8. Provide a summary of the analysis performed and conclusion reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- descriptions of the site and local groundwater aquifers, including geohydrologic characterization data (from the ER and ESRP/S1 2.2.1)
- descriptions of the spatial and seasonal changes in water table elevation and pumpage rates for wells both inside and outside the site boundary (from the ER)
- descriptions of any currently employed or proposed practices and measures to control or limit operational water-use impacts (from the ER)
- descriptions of Federal, State, regional, local, and affected Native American tribal agencies' standards and regulations applicable to groundwater use (from consultation with Federal, State, regional, local, and Native American tribal agencies)
- descriptions of proposed means to ensure operational compliance with water-quality and water-use standards and regulations (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of water-use impacts at the plant's site are based on the relevant requirements of the following:

- 40 CFR 149 with respect to possible supplemental restrictions on water use in or above a sole source aquifer.
- Federal, State, regional, local, and affected Native American tribal agencies' water laws and water rights
- 10 CFR 51 Subpart A, Appendix B, Table B-1 with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides guidance as to the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.
- In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the U.S. Supreme Court granted the States additional authority to limit hydrological alterations beyond the States' role in regulating water rights. As a result of this ruling, the States may regulate the quantity of water as a part of the definition of water quality.

Technical Rationale

The technical rationale for evaluating the applicant's potential groundwater-use impacts is discussed in the following paragraph:

According to the analysis in NUREG-1437, groundwater water-use conflicts with nearby groundwater users at plants pumping groundwater with Ranney wells may be SMALL, MODERATE, or LARGE. The SEIS should include an analysis that considers the potential of groundwater-use conflicts of plants employing Ranney wells.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the impact of Ranney-well operation. Suggested steps for the review process are as follows:

- (1) For plants using Ranney wells, review the NUREG-1437 discussion of potential for groundwater-use conflicts with nearby groundwater users.
- (2) Determine the seasonal groundwater pumpage needs for the plant.
- (3) Determine the extent of the influence of the plant's use of Ranney wells predicted using either standard analytic approaches or numerical models. Steady-state analytic approaches can be used with the maximum seasonal pumping rates. Numerical models can be used either with the maximum

pumping rate to estimate steady-state drawdown or with the average seasonal pumping rates for a transient simulation of the drawdown. Model results should be validated with piezometer observations. Possible impacts on predictions from heterogeneous aquifer parameters, particularly stratigraphy, should be considered. If the extent of the cone of depression caused by the plant's well(s) extends beyond the site's boundary, then continue the analysis at Step (4). Otherwise, prepare a statement for the SEIS that describes the plant's groundwater water use and concludes that there are no impacts resulting from groundwater pumpage from the Ranney well.

- (4) Determine the magnitude of the reduction in yield resulting from the plant's pumpage predicted by numerical procedures. If the drawdown extends beyond the site boundary and into a zone influenced by other wells, then continue the analysis with Step (5). Otherwise, prepare a statement for the SEIS that describes the plant's groundwater water use and concludes that there are no impacts resulting from groundwater pumpage from the Ranney well.
- (5) Estimate the reduction in yield caused by the plant's pumpage. Based on the magnitude of the reduction in yield, define the impact as SMALL, MODERATE, or LARGE. If the impacts are MODERATE or LARGE, evaluate potential mitigation measures. Then, prepare a statement for the SEIS that describes the plant's groundwater water use and describes the impacts and mitigation measures, and concludes that the impacts are SMALL, MODERATE, or LARGE, as appropriate.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of the plant's Ranney well. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in a SEIS are provided in the following paragraphs:

The applicant has stated that the reduction in yield of nearby groundwater users' wells resulting from the plant's Ranney well withdrawals does not reduce the yield of groundwater of other water users' wells that share the same aquifer as a source of water. The staff did not find any information to the contrary. Therefore, the staff concludes that the plant's groundwater pumpage will have no impact on the nearby groundwater users.

The applicant has stated that the reduction in yield of nearby groundwater users' wells resulting from the plant's Ranney well withdrawals does not significantly reduce the yield of groundwater of other water users' wells that share the same aquifer as a source of water. The staff did not find any information to the contrary. Therefore, the staff concludes that the plant's groundwater pumpage will have a SMALL impact on the nearby groundwater users.

The applicant has stated that the reduction in yield of nearby groundwater users' wells resulting from the plant's Ranney well significantly reduces the yield of groundwater of other water users' wells that share the same aquifer as a source of water. The applicant has committed to mitigating any impacts that reduce groundwater yield by _____. (For example, by installing groundwater recharge

using treated waste-water effluent to increase the seasonal yield of the aquifer.) Therefore, the staff concludes that the plant's groundwater pumpage will have a (MODERATE or LARGE) impact on the nearby groundwater users.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 149, "Sole Source Aquifers."

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Regulatory Guide 4.2, Supplement 1. Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.5.4 GROUNDWATER-QUALITY DEGRADATION (COOLING PONDS AT INLAND SITES)

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of the potential impact of groundwater-quality degradation resulting from closed cycle cooling ponds at inland sites. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants* (NRC 1996), and Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant is required by 10 CFR 51.53(c)(3)(ii)(D) to address this issue in its environmental report (ER) if the plant employs cooling ponds.

The scope of the review directed by this plan includes (1) review of the discussion of the issue in NUREG-1437, (2) evaluation of the data and analysis in the applicant's ER, (3) independent analysis and evaluation of the data, if appropriate, and (4) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.2.1. Obtain a description of the plant location and location of local aquifers and surface water bodies.

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4.5.4-1

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.2.3. Obtain descriptions of the cooling pond and its operational requirements.
- ESRP/S1 2.3.2. Obtain descriptions of water use of other users near the plant.
- ESRP/S1 4.8. Provide a summary of the analysis performed and conclusion reached.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impact. The following data or information may be needed:

- descriptions of cooling pond characteristics (e.g., use of liners, use of impermeable materials, impermeable soils) that would retard/prevent infiltration into local aquifers (from ESRP/S1 2.2.3 and the ER)
- descriptions of types and concentrations of impurities in the cooling pond water and chemistry of soils along pathways to local aquifers to determine whether cooling pond water can contaminate the groundwater (from ESRP/S1 2.2.3 and the ER)
- descriptions of quality of water of local aquifers that could be affected by infiltration of cooling-pond water (from ESRP/S1 2.3.3 and the ER)
- descriptions of Federal, State, regional, local, and affected Native American tribal agencies' groundwater quality requirements with emphasis on any changes to these requirements that have occurred during the plant's initial license term and any anticipated changes to those requirements during the license renewal (LR) term (from consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- descriptions of offsite groundwater users who could be affected by the degradation of aquifers; characterization should include locations and elevations of offsite wells, their pumping rates, and the water needs of groundwater users (from ESRP/S1 2.3.2 and the ER)
- descriptions of the predicted cumulative effects of using closed cycle cooling ponds on groundwater quality. This description should include maps of the contamination plume. Information should be provided on groundwater contamination existing at the time of LR application and projected contamination during the LR periods (from the ER)

- descriptions of the mitigation measures proposed to prevent or minimize groundwater-quality degradation and the estimated impact of implementing these measures. Explain the reasons for not implementing any measures that were considered but rejected (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of groundwater-quality degradation resulting from closed-cycle cooling ponds at inland sites are based on the relevant requirements of the following regulations:

- 40 CFR 6, Appendix A, with respect to procedures on floodplain and wetlands protection
- 40 CFR 122 with respect to the National Pollutant Discharge Elimination System (NPDES) permit conditions for discharges including storm-water discharges
- 40 CFR 124 with respect to the NPDES process
- 40 CFR 125 with respect to water-quality standards
- 40 CFR 133 with respect to treated effluents
- 40 CFR 149 with respect to possible supplemental restrictions on waste disposal and water use in or above a sole source aquifer
- 40 CFR 165 with respect to the disposal and storage of pesticides
- 40 CFR 227 with respect to criteria for evaluating environmental impacts
- 40 CFR 403 with respect to waste effluents
- 40 CFR 423 with respect to effluent limitations on existing and new point sources
- 40 CFR 700-716 with respect to practices and procedures for managing toxic chemicals
- Federal, State, regional, local, and affected Native American tribal agencies' water laws and water rights
- 10 CFR 51 Subpart A, Appendix B, Table B-1 with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- Compliance with environmental quality standards and requirements of the Federal Water Pollution Control Act (FWPCA), commonly referred to as the Clean Water Act, is not a substitute for and does not negate the requirement for NRC to weigh the environmental impacts of the proposed action, including any degradation of water quality, and to consider alternatives to the proposed action that are available for reducing the adverse impacts. If an environmental assessment of aquatic impacts is available from the permitting authority, the NRC should consider the assessment in its determination of the magnitude of the environmental impacts in striking an overall benefit-cost balance. When no such assessment of aquatic impacts is available from the permitting authority, the NRC (to the degree possible in conjunction with the permitting authority and other agencies having relevant expertise) should establish its own impact determination.
- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.
- In *Jefferson County PUD #1 vs. Department of Ecology* (U.S. Supreme Court Case), the U.S. Supreme Court granted the States additional authority to limit hydrological alterations beyond the States' role in regulating water rights. As a result of this ruling, the States may regulate the quantity of water as a part of the definition of water quality.

Technical Rationale

The technical rationale for evaluating the applicant's potential groundwater quality impacts is discussed in the following paragraph:

According to the analysis in NUREG-1437, groundwater-quality degradation resulting from closed-cycle cooling ponds at inland sites leaking into aquifers beneath the site may be a SMALL, MODERATE, or LARGE impact. The SEIS should include an analysis that considers this potential for groundwater-quality degradation for plants using cooling ponds.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the potential impact of groundwater-quality degradation on local groundwater uses. Suggested steps for the review process are as follows:

- (1) Review the discussion of the potential for groundwater-quality degradation resulting from closed-cycle cooling-pond sites leaking into aquifers beneath inland sites in NUREG-1437.
- (2) Determine the evolving chemical composition of the cooling pond water. Closed cycle cooling ponds have concentrations of total dissolved solids, heavy metals, and chlorinated organic compounds as a result of evaporation, contact with plant equipment, and water-treatment systems, respectively. These concentrations can evolve over time. The current chemical composition of the cooling water should be described, as well as the estimated chemical composition throughout the renewal term.
- (3) Review monitoring data on the chemical composition of groundwater in the vadose zone and aquifer that would likely receive water infiltrating from the cooling pond, as well as groundwater unaffected by the cooling pond. If the ambient groundwater quality in the aquifer is better than the estimated quality of the cooling pond water during the LR period, then continue with Step (4). Otherwise, prepare a statement for the SEIS that describes the plant's cooling ponds and concludes that there are NO impacts to groundwater users resulting from degradation in groundwater quality.
- (4) Review monitoring data on the infiltration from the cooling ponds to the water table. If the cooling ponds have no liners or the liners are not expected to remain impermeable throughout the LR period, then proceed to Step (5). Otherwise, prepare a statement for the SEIS describing the plant's cooling ponds that concludes that there are no impacts to groundwater users resulting from degradation in groundwater quality.
- (5) Describe the estimated infiltration rate from the ponds throughout the LR period. These estimates should be used as the boundary conditions for a groundwater flow and transport model. Vadose zone transport can be neglected if the water infiltrating beneath the cooling pond is assumed to immediately enter the aquifer. If the predicted groundwater plume associated with a conservative non-sorbing tracer is likely to enter the zone of influence of a well, then proceed to Step (6). Otherwise, prepare a statement for the SEIS that describes the plant's cooling ponds and concludes that there are no impacts to groundwater users resulting from degradation in groundwater quality.
- (6) Describe the changes in water quality for each of the impacted wells. Both the timing and magnitude of water-quality changes should be described. Because this analysis will require the application of

groundwater flow and transport simulation models, describe the model calibration activities and any peer-review activities. Compare the predicted changes in groundwater quality to the uses for which the groundwater is needed to assess the magnitude of the impact.

- (7) Determine the level of significance of the impacts. If the level of significance is MODERATE or LARGE, then continue with Step (8). Otherwise, prepare a statement for the SEIS that describes the plant's cooling ponds and concludes that the impacts to groundwater users resulting from degradation in groundwater quality are SMALL.
- (8) Identify and evaluate potential mitigation measures. Then prepare a statement for the SEIS that describes the impacts following mitigation and concludes that the level of significance of the impacts to groundwater users resulting from degradation in groundwater quality is SMALL, MODERATE, or LARGE, as appropriate.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential impacts of cooling ponds on groundwater quality. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

The applicant has stated that the quality of the groundwater will not be degraded as a result of leakage from cooling ponds. The staff did not find any information to the contrary. Therefore, the staff concludes that the leakage from the plant's cooling ponds will have no impact on the nearby groundwater users.

The applicant has stated that the quality of the groundwater is not significantly degraded as a result of leakage from cooling ponds. The staff did not find any information to the contrary. Therefore, the staff concludes that the leakage from the plant's cooling ponds will have a SMALL impact on the nearby groundwater users.

The applicant has stated that the quality of the groundwater will be significantly degraded as a result of leakage from cooling ponds. The applicant has committed to mitigating future degradation in groundwater quality by _____. (For instance, installing impermeable liners beneath the cooling ponds and installing a monitoring system beneath the cooling ponds.) The mitigation measures are appropriate; no further mitigation measures are warranted. The staff concludes that the leakage from the plant's cooling ponds will have (MODERATE or LARGE) impact on the nearby groundwater users.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR 6, Appendix A, "Statement of Procedures on Floodplain Management and Wetlands Protection."

40 CFR 122, "EPA Administered Permit Programs: The NPDES Pollution Elimination System."

40 CFR 124, "Procedures for Decision Making."

40 CFR 125, "Criteria and Standards for the National Pollution Elimination System."

40 CFR 133, "Secondary Treatment Regulations."

40 CFR 149, "Sole Source Aquifers."

40 CFR 165, "Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers."

40 CFR 227, "Criteria for the Evaluation of Permit Applications for Ocean Dumping of Material."

40 CFR 403, "General Pretreatment Regulations for Existing and New Sources of Pollution."

40 CFR 423, "Steam Electric Power Generating Point Source Category."

40 CFR 700-716, "Relevant Sections of Toxic Substances Control Act."

Federal Water Pollution Control Act (FWPCA), also known as the Clean Water Act, as amended, 33 USC 1251 et seq.

Jefferson County PUD #1 vs. Department of Ecology, 92-1911, Supreme Court of the United States, 510 U.S. 1037; 114 S. Ct. 677; 1994 U.S. LEXIS 795; 126 L. Ed. 2d 645; 62 U.S.L.W. 3450 (January 10, 1994).

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.6 THREATENED OR ENDANGERED SPECIES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of an introduction to the supplemental environmental impact statement (SEIS) section on potential impacts of operations during the renewal term on threatened or endangered species. The potential impacts of operations during the renewal term on threatened or endangered species was identified as a Category 2 issue in Section 4.9 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. Applicants for license renewal (LR) are required to perform plant-specific reviews of this issue by 10 CFR 51.53(c)(3)(ii)(E). The issue is addressed specifically in ESRP/S1s 4.6.1.

The scope of the review directed by this plan includes review of the discussion of potential impacts of operation during the renewal term on threatened or endangered species in NUREG-1437 and preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s as appropriate for the planned plant operation during the renewal term:

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 2.1.1. Obtain a description of the plant appearance and setting and a description of changes to be made during refurbishment.
- ESRP/S1 2.1.7. Obtain a description of the power transmission system and any changes to be made associated with refurbishment.
- ESRP/S1 2.2.5. Obtain a list of threatened or endangered aquatic species and sensitive habitats.
- ESRP/S1 2.2.6. Obtain a list of threatened or endangered terrestrial species and sensitive habitats.
- ESRP/S1 3.8.1. Obtain a description of the impacts of refurbishment activities on threatened or endangered species.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP/S1 should obtain the proposed organizational structure for the SEIS from the Environmental Project Manager:

II. ACCEPTANCE CRITERIA

The introductory paragraph prepared under this ESRP/S1 should be consistent with the intent of the following regulations:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- There are no regulatory positions specific to this ESRP/S1.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential impacts of operation during the renewal term on threatened or endangered species is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is introductory in nature; no specific data analysis is required.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP/S1 should prepare at least one introductory paragraph for the SEIS. The paragraph(s) should introduce the material to be presented by the reviewer for ESRP/S1 4.6.1. The introduction should list the types of information to be presented and describe its relationship to information presented elsewhere in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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4.6.1 THREATENED OR ENDANGERED SPECIES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and evaluation of potential impacts to Federally listed threatened or endangered species or designated critical habitats, including species proposed to be listed as threatened or endangered and habitats proposed to be designated as critical, from operations during the renewal term. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(E) to assess the impacts of operations the renewal term on threatened or endangered species or critical habitats in its environmental report (ER).

The scope of the review directed by this plan includes consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (referred to collectively as the Service) under Section 7 of the Endangered Species Act (ESA) and preparation of input to the supplemental environmental impact statement (SEIS). The consultation process involves an analysis of the effects of onsite and offsite refurbishment activities, including any new transmission line and access corridor construction. The Service concludes the consultation process by rendering a decision with respect to the significance of potential impacts to listed and proposed threatened or endangered species or critical habitats with any reasonable and prudent alternatives for avoiding or reducing such impacts.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1 2.1.1. Obtain information about the power plant's external appearance and layout in enough detail to support the required analyses.
- ESRP/S1 2.1.3. Obtain information about the cooling intake and discharge systems.
- ESRP/S1 2.1.7. Obtain information about the power-transmission system in enough detail to support the analyses.
- ESRP/S1 2.2.5. Obtain a description of listed and proposed threatened or endangered species or critical habitats on or in the vicinity of the site.
- ESRP/S1 2.2.6. Obtain a description of terrestrial listed and proposed threatened or endangered species or critical habitats on or in the vicinity of the site.
- ESRP/S1 3.8.1. Provide coordination for consultations with the Service with the reviewer of ESRP/S1 3.8.1.
- ESRP/S1s 4.1 and 4.5. Obtain information about impacts of operations during the renewal term on surface-water and groundwater quality.
- ESRP/S1 4.8. Provide a summary statement describing the material reviewed, analyses performed, and decisions rendered by the Service as a result of consultation.
- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The level of detail should be scaled according to the anticipated magnitude of potential impacts. The following information should be obtained for consultation with the Service. The following data or information may be needed:

- a description of the renewal term operations (from the ER and ESRP/S1s 2.1.1 through 2.1.7)
- a description of the listed and proposed threatened or endangered species or critical habitats on or in the vicinity of the site (from the ER and ESRP/S1s 2.2.5 and 2.2.6)

- a description of the manner in which operation during the renewal term is anticipated to impact listed and proposed threatened or endangered species or critical habitats (from the ER and ESRP/S1s 4.1.2 through 4.1.4 for impacts from the cooling system).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of operation during the renewal term on threatened or endangered species are based on the relevant requirements of the following regulations:

- 10 CFR 51.45 with respect to ERs and the analysis of potential impacts contained therein
- Endangered Species Act of 1973, as amended, with respect to identifying impacts to listed and proposed threatened or endangered species or critical habitats by means of consultation with the USFWS or NMFS.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) states that compliance with the ESA cannot be assessed without site-specific consideration of potential effects from renewal-term operations on listed and proposed threatened or endangered species or critical habitats
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's potential impacts from operation during the renewal term to listed and proposed threatened or endangered species or critical habitats is discussed in the following paragraph:

The SEIS must include an analysis that considers the impacts of operations during the renewal term on listed and proposed threatened or endangered species or critical habitats and reasonable and prudent alternatives for avoiding or reducing such adverse effects. The acceptance criteria listed above ensure that impacts to listed and proposed threatened or endangered species or critical habitats are considered.

III. REVIEW PROCEDURES

The review associated with this issue should be conducted in stages to permit termination of the review process when sufficient analysis has been completed to reach a conclusion about the effects of renewal term operations on threatened or endangered species. Suggested steps for the review process are as follows:

- (1) Review the discussion of potential impacts of operations during the renewal term on threatened or endangered species in NUREG-1437. They should include results of requests to Service for listed species in the project area.
- (2) Identify potential environmental effects related to operations during the renewal term that might impact threatened or endangered species or critical habitat.

If any potential environmental effects of operations during the renewal term are identified that might impact threatened or endangered species or critical habitat, then continue the analysis at Step (3). Otherwise, prepare input to the SEIS which states that operations during the renewal term will not affect the environment. Therefore, there will be no impacts on threatened or endangered species.

- (3) Initiate informal consultation with the Service to determine the likelihood of adverse effects on listed and proposed threatened or endangered species or critical habitats. The NRC will provide the Service with a description of operations during the renewal term, a description of any listed and proposed threatened or endangered species or critical habitats that it knows to exist on or in the vicinity of the site, and a description of the manner in which operations during the renewal term is anticipated to impact listed and proposed threatened or endangered species or critical habitats.

A detailed description of the procedural requirements for consultation under the ESA, including definitions of listed and proposed threatened and endangered species and critical habitats, jeopardy, adverse modification, etc., are found in the USFWS (1998). This document also contains guidelines for procuring an incidental take permit.

If the consultation process finds (1) listed threatened or endangered species or critical habitats are likely to be present on or in the vicinity of the site, and (2) listed threatened or endangered species or critical habitats are definitely present on or in the vicinity of the site, and will be adversely affected, then continue the analysis at Step (4). Otherwise, prepare input for the SEIS that summarizes the information which has been reviewed, the analyses that have been conducted, and the basis for the Biological Opinion rendered by the Service and concludes that there will be no impacts to listed threatened or endangered species or critical habitats from operations during the renewal term.

- (4) Initiate a biological assessment, if one is requested by the Service as a prerequisite to making a finding in the informal consultation. A biological assessment is required if listed threatened or endangered species or critical habitats may be present in the area to be affected by major construction activities, and is optional only if proposed threatened or endangered species or critical habitats

are involved.

Although the NRC takes responsibility for the findings, the biological assessment is usually prepared by the applicant or a non-Federal representative. The biological assessment should address listed and proposed threatened or endangered species and critical habitats that are likely to be affected. The content of biological assessments prepared pursuant to the ESA are at the discretion of the NRC, although recommended contents may be found in 50 CFR 402.12. State wildlife or fisheries agencies, Natural Heritage Programs, and state offices of environmental organizations such as The Nature Conservancy can provide useful information for designing the biological assessment.

For each proposed species or critical habitat that the Service concludes is potentially jeopardized by operations during the renewal term, continue with the analysis at Step (5). Similarly, for each listed species or critical habitat that the Service concludes is likely to be adversely affected, continue the analysis at Step (5). For the remaining species and habitats, prepare a statement for the SEIS that (1) summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the opinion rendered by the Service and (2) concludes that there will be no impacts to listed threatened or endangered species or critical habitats from operations during the renewal term.

- (5) Initiate formal consultation with the Service to determine if operations during the renewal term are likely to jeopardize the continued existence of a listed species (jeopardy) or destroy or adversely modify critical habitat (adverse modification). The Service will render a biological opinion of jeopardy/no jeopardy and adverse modification/no adverse modification and issue an incidental take statement as warranted. The Service will also provide a list of reasonable and prudent alternatives (e.g., alternative design and/or placement of structures, alternative schedules, or alternative operational procedures, habitat improvement, etc.) for avoiding jeopardy or adverse modification, and minimizing incidental take. Alternatively, the Service may provide a statement that no reasonable and prudent alternatives exist, along with an explanation.

If the Service renders an opinion of no jeopardy and no adverse modification, then prepare a statement for the SEIS that (1) summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the decision rendered by the Service, and (2) concludes that operations during the renewal term will not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat.

Otherwise, if the Service renders an opinion of jeopardy and/or adverse modification, prepare a statement for the SEIS that (1) summarizes the information that has been reviewed, the analyses that have been conducted, and the basis for the decision rendered by the Service, (2) includes a list of reasonable and prudent alternatives for avoiding jeopardy and/or adverse modification, or provides a statement that no reasonable and prudent alternatives exist, (3) includes a statement regarding the magnitude of anticipated incidental take and a list of reasonable and prudent alternatives for avoiding or reducing incidental take, and, if needed, procurement of an incidental take permit under sections 10(a)(1)(A) and 10(a)(1)(B) of the ESA, and (4) concludes that operations during the renewal term

will jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat.

IV. EVALUATION FINDINGS

The depth and extent of input to the SEIS will be governed by the attributes of the listed and proposed threatened or endangered species or critical habitats that could be affected by operations during the renewal term and by the magnitude of the expected impacts on these resources. This section of the SEIS should present (1) a list of adverse impacts to listed and proposed threatened or endangered species or critical habitats from operations during the renewal term, (2) a list of the impacts for which there are reasonable and prudent alternatives to limit adverse effects and the associated alternatives, and (3) the applicant's commitments to limit these impacts. This information should be summarized and provided to the reviewer of ESRP/S1 3.10.

If the reviewer verifies that consultation with the Service under Section 7 of the ESA is complete, then the evaluation will support one of the following concluding statements to be included in the SEIS:

The staff has completed consultation with the Service relative to potential impacts to listed and proposed threatened or endangered species or critical habitats from operations during the renewal term. Based on this consultation, the staff concludes that the impact is **SMALL**, and mitigation is not needed.

The staff has completed consultation with the Service relative to potential impacts to listed and proposed threatened or endangered species or critical habitats from operations during the renewal term. Based on this consultation, the staff concludes that the impact is **MODERATE**. Reasonable and prudent alternatives to limit adverse effects have been identified by the Service and will be implemented as follows:

(List)

The staff has completed consultation with the Service relative to potential impacts to listed and proposed threatened or endangered species or critical habitats from operations during the renewal term. Based on this consultation, the staff concludes that the impact is **LARGE**. Reasonable and prudent alternatives to limit adverse effects have been identified by the Service and will be implemented as follows:

(List)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.45, "Environmental report."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

50 CFR 402.12, "Biological assessments."

Endangered Species Act of 1973, as amended 16 USC 1531 et seq.

National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.

U.S. Fish and Wildlife Service (USFWS). 1998. *Endangered Species Act Consultation Handbook (Washington, D.C.): Procedures for Conducting Section 7 Consultations and Conferences (Final)*.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.



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4.7 SIGNIFICANT NEW INFORMATION ON IMPACTS OF OPERATIONS DURING THE RENEWAL TERM

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of significant new information related to the potential impacts of operation during the renewal term and preparation of an introductory section to the supplemental environmental impact statement (SEIS).

The scope of the review directed by this ESRP includes (1) preparation of a consolidated list of environmental issues related to renewal term operations for which there is significant new information, (2) introduction of SEIS sections presenting the staff's analyses related to those issues, or (3) preparation of a short section for the SEIS stating that there are no issues related to the environmental impacts for which there is significant new information.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s), as indicated:

- ESRP/S1s 4.1 through 4.6. Obtain lists of issues for which there is significant new information.
- ESRP/S1 4.8. Provide a summary of the reviews conducted and conclusions reached.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 4.9. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- lists of issues for which there is significant new information (from reviewers of ESRP/S1s 4.1 through 4.6)
- organizational structure of the SEIS (from the Environmental Project Manager).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of operation during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment and with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71(d) with respect to compliance with environmental-quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides guidance with regard to the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating significant new information is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to preparation of a section of the SEIS that introduces the significant new information, if any.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 4.1 through 4.6 and compile a list of environmental issues for which there is significant new information. If there is no issue for which there is significant new information, then the reviewer should prepare a statement to that effect for the SEIS. Otherwise, the reviewer should prepare one or more paragraphs for the SEIS introducing the SEIS sections that present the findings of the analyses on the issues for which there is significant new information.

If there is no issue for which there is significant new information, the SEIS statement should make the following points:

- there has been a search for new information on potential environmental impacts related to operation during the renewal term
- the significance of any new information, if any, has been assessed
- there is no issue for which there is significant new information.

If there are issues for which there is significant new information, each issue should be addressed in a separate SEIS section. The introductory paragraphs prepared under this ESRP should identify the issue and direct readers to the SEIS sections where the issues are addressed.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare an SEIS section that either states that there is no issue for which there significant new information or introduces the SEIS sections that discuss the issues for which there is significant new information.

If there is no issue for which there is significant new information, the reviewer should prepare a paragraph for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts associated with operation during the renewal term in NUREG-1437 and in the applicant's environmental report, has conducted public scoping, and has conducted its own independent review. In this process, the staff did not discover any environmental issue related to operation during the renewal term for which there is significant new information.

If there are issues for which there is significant new information, the review should prepare introductory paragraphs for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts associated with operation during the renewal term in NUREG-1437 and in the applicant's environmental report, has conducted public scoping, and has conducted its own independent review. In this process, the staff has determined that there is significant new information related to ____ and _____. Section ____ of this SEIS describes the issue, gives the staff's analysis, and discusses mitigation alternatives for _____. Section _____ covers _____.

Where appropriate, a statement similar to the following should be included in the SEIS. _____ is part of the Category 1 issue related to _____. Reconsideration of the conclusions for this issue is limited in scope to the assessment of the relevant new and significant information. The scope does not include review of other facets of the issue that are not affected by the new information.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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4.8 SUMMARY OF IMPACTS OF OPERATION DURING THE RENEWAL TERM

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section for the supplemental environmental impact statement (SEIS) that summarizes conclusions related to the environmental impacts of operation during the renewal term.

The scope of the review directed by this plan covers a collection of summary statements prepared by reviewers of supplemental ESRPs (ESRP/S1s) 4.1 through 4.7 and consolidation of the summary statements in an SEIS section. It also includes preparation of lists of unavoidable adverse impacts and irreversible or irretrievable resource commitments and evaluation of the effects of short-term use on maintenance and enhancement of long-term productivity related to operation during the renewal term.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1s 4.1 through 4.7. Obtain summary statements that succinctly give conclusions reached in the staff reviews.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 9.0. Provide lists of unavoidable adverse impacts and irreversible or irretrievable resource commitments of operation during the renewal term and an evaluation of the effect of short-term use on maintenance and enhancement of long-term productivity of the environment.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The reviewer for this ESRP should obtain summary statements from reviewers of ESRP/S1s 4.1 through 4.7.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of operational activities during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.53 with respect to the content of environmental reports and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.

Technical Rationale

The technical rationale for providing a summary of conclusions at the end of the SEIS chapter is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. A summary of conclusions reached is presented at the end of each chapter in NUREG-1437. It is planned that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 4.1 through 4.7 and compile a list of conclusions from the SEIS sections that the reviewers have prepared. The conclusions should be checked for completeness and prepared for inclusion in the SEIS. The conclusions should not contain references.

The reviewer for ESRP/S1 4.8, together with the other reviewers for Chapter 4 ESRP/S1s, should identify those adverse environmental effects of operation during the renewal term that are unavoidable and commitment of resources related to operation during the renewal term that are irreversible or irretrievable. Lists of these impacts should be provided to the reviewer for ESRP/S1 9.0 for inclusion in the SEIS summary. These reviewers should also evaluate the effects of the short-term use on maintenance and enhancement of long-term productivity of the environment. The results of this evaluation should be provided to the reviewer for ESRP/S1 9.0.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists the conclusions of the SEIS sections covering environmental impacts of operation during the renewal term. The completed list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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4.9 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on the environmental impacts of operation during the renewal term.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 4.1 through 4.7. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional plant-specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. In NUREG-1437 reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 4.1 through 4.7 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering environmental impacts of refurbishment. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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5.0 ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes environmental impacts of postulated plant accidents during the license renewal (LR) term.

The scope of this plan is the development of paragraphs that introduce the material from the reviews conducted under supplemental ESRPs (ESRP/S1s) 5.1 and 5.2. It includes the description of the environmental issues associated with postulated accidents discussed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 5.1. Obtain a list of environmental issues, if any, related to postulated accidents during the renewal term for which there is new and significant information.
- ESRP/S1 5.2. Provide a list of the environmental issues, if any, related to postulated accidents during the renewal term for which there is significant new information.

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- ESRP/S1 5.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP should obtain the organizational structure of the SEIS from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (DEIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of a DEIS at the LR stage
- 10 CFR 51.95(c) with respect to preparation of a final environmental impact statement (EIS) at the LR stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999) provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential environmental impacts of postulated accidents during the renewal term is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues that are designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted

under this ESRP leads to preparation of introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS and add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required. The environmental issue associated with operation during the renewal term that was considered in NUREG-1437 and determined to be a Category 1 issue is listed in the following table:

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Sup 1 Sections |
|--|----------|---|---------------------------|
| POSTULATED ACCIDENTS | | | |
| Design basis accidents | 1 | 5.3.2 5.5.1 | 5.1 |
| Severe accidents | (a) | 5.3.3 5.3.3.2 5.3.3.3 5.3.3.4 5.3.3.5 | 5.1 |

Generic conclusions relative to impacts were reached for those issues that are appropriate for all plants, or for some issues for specific classes of plants. These conclusions were that (1) a single level of significance could be assigned to the impact and (2) plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. The generic analysis of severe accidents analysis described in NUREG-1437 applies to all plants. It concludes that the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts of severe accidents are of small significance. In the absence of new and significant information, these issues may be addressed in the SEIS without additional plant-specific analysis.

Environmental issues considered in NUREG-1437 for which these conclusions could not be reached for all plants, or for specific classes of plants, are Category 2 issues. The Category 2 issue related to postulated accidents is listed in the following table:

-
- (a) The Commission determined that the NUREG-1437 analysis of severe accident consequences and risk is adequate, and additional plant-specific analysis of these impacts is not required. Only alternatives to mitigate severe accidents must be considered for all plants that have not previously considered such alternatives in a previous ER.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Sup 1 Sections | 10 CFR 51.53(c)(3)(ii) subparagraph |
|--|----------|---------------------|---------------------------|-------------------------------------|
| POSTULATED ACCIDENTS | | | | |
| Severe accidents/mitigation alternatives | 2 | 5.4 5.5.2 | 5.1.1 | L |

Not all plants have performed a site-specific analysis of the measures that could mitigate the consequences of severe accidents. Consequently, alternatives to mitigate severe accidents are a Category 2 issue for plants that have not performed a site-specific evaluation of severe accident mitigation alternatives and submitted that evaluation to the Commission for review. A plant-specific analysis is required for this issue.

If there is new and significant information related to the environmental impacts associated with postulated accidents during the renewal term identified by the applicant, by the public, or by the staff, the reviewer for this ESRP should prepare a table that directs readers to the SEIS sections dealing with the issues.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/S1s 5.1, 5.1.1, and 5.2. The paragraph(s) should list the types of information to be presented and describe their relationships to information presented earlier and to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCE

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51 Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington D.C.



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5.1 POSTULATED PLANT ACCIDENTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of environmental impacts of postulated plant accidents during the license renewal (LR) term and preparation of input to the supplemental environmental impact statement (SEIS). These issues are discussed in Chapter 5 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the NUREG-1437 discussion of postulated accidents, (2) identification and evaluation of new information related to environmental impacts of postulated accidents during the renewal term for significance, (3) preparation of input to the SEIS that disposes the Category 1 issues, and (4) preparation of input to the SEIS that introduces the discussion of the Category 2 issue.

Impacts of design basis accidents (DBAs) during the renewal term is a Category 1 issue. NUREG-1437 and Table B-1 Appendix B, Subpart A to 10 CFR 51 list severe accidents as a Category 2 issue. The text in 10 CFR 51, Table B-1, Appendix B, Subpart A states that the probability weighted consequences of atmospheric releases to groundwater and societal and economic impacts from severe accidents are small for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. A plant-specific review of alternatives to mitigate severe

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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accidents is required by 10 CFR 51.53(c)(3)(ii)(L) if the NRC staff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement (EIS),

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Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

SEIS, or environmental assessment. If a SAMA review has been conducted then only new and significant information should be evaluated in accordance with ESRP/S1 5.2. The required plant-specific review is addressed specifically in supplemental ESRP (ESRP/S1) 5.1.1.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 5.2. Provide a list of the environmental issues related to postulated accidents during the renewal term for which there is significant new information.
- ESRP/S1 5.3. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 5.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on environmental issues related to postulated accidents during the renewal term (from the environmental report [ER])
- new information on environmental impacts of postulated plant accidents during the renewal term known to the applicant (from the ER)
- new and potentially significant information on environmental impacts of postulated plant accidents during the LR term identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of postulated plant accidents during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the LR stage

- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft environmental impact statements (DEISs) at the LR stage
- 10 CFR 51.95(c)(4) with respect to contents of SEIS and consideration of significant new information
- 10 CFR 51 Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b) provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of postulated plant accidents during the renewal term is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions from NUREG-1437 related to postulated plant accidents during the renewal term, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of postulated plant accidents during the renewal term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the issue in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table lists the postulated plant accidents issue that was addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Supplement 1 Sections |
|--|----------|---|----------------------------------|
| POSTULATED ACCIDENTS | | | |
| Design basis accidents | 1 | 5.3.2 5.5.1 | 5.1 |
| Severe accidents | (a) | 5.3.3 5.3.3.2 5.3.3.3 5.3.3.4 5.3.3.5 | 5.1 |

- (2) Determine if there is new information on this issue that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information related to environmental impacts of postulated accidents and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?

-
- (a) The Commission determined that the NUREG-1437 analysis of severe accident consequences and risk is adequate, and additional plant-specific analysis of these impacts is not required. Only alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives in a previous ER.

- environmental standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare the section for SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare a section for the SEIS describing the search for new information, summarizing the new information found, presenting results of the evaluation of significance, and adopting a conclusion from NUREG-1437.

(4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of the SEIS.

(5) Prepare a section for the SEIS describing the search for new information, summarizing the new information found, presenting the results of evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the environmental impacts of postulated accidents during the renewal term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Design basis accidents: Based on information in the GEIS, the Commission found that

“The NRC staff has concluded that the environmental impacts of design basis accidents are of small significance for all plants.”

The staff has not identified any significant new information during its independent review of the ____ ER, the staff's site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information, including reports of studies of the _____ performed for the _____. Therefore, the staff concludes that there are no impacts of design basis accidents during the renewal term beyond those discussed in the GEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Design basis accidents: Based on information in the GEIS, the Commission found that

“The NRC staff has concluded that the environmental impacts of design basis accidents are of small significance for all plants.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to design basis accidents has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no impacts of design basis accidents during the renewal term beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Design basis accidents: Based on information in the GEIS, the Commission found that

“The NRC staff has concluded that the environmental impacts of design basis accidents are of small significance for all plants.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(c), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to design basis accidents has been identified

-
- (a) Include this phrase only in the final SEIS.
 - (b) Include this phrase only in the final SEIS.
 - (c) Include this phrase only in the final SEIS.

(List)

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g., 5.2.1, 5.2.2, etc.])

The staff determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of altered current patterns during the renewal term beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1.
*Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant
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5.1.1 SEVERE ACCIDENT MITIGATION ALTERNATIVES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of the severe accidents for the applicant's plant. This issue was identified as a Category 2 issue in NUREG-1437, *Generic Environmental Statement for License Renewal of Nuclear Plants* (NRC 1996), and in Table B-1 of Appendix B, Subpart A to 10 CFR 51. An applicant for license renewal (LR) is required by 10 CFR 51.53(c)(3)(ii)(L) to consider alternatives to mitigate severe accidents at the plant if the staff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement (EIS) or related supplement or in an environmental assessment for the plant.

The scope of the review directed by this plan includes an analysis of severe accident mitigation alternatives (SAMAs), referred to as severe accident mitigation design alternatives (SAMDAs) in some references, and the preparation of an appropriate statement for the supplemental environmental impact statement (SEIS). The analysis of SAMAs includes the identification and evaluation of alternatives that reduce the radiological risk from a severe accident by preventing substantial core damage (i.e., preventing a severe accident) or by limiting releases from containment in the event that substantial core damage occurs (i.e., mitigating the impacts of a severe accident). The intent is to identify additional cases that might warrant either additional features or other actions that would prevent or mitigate the consequences of serious accidents.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 5.2. Provide a summary statement describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 5.3. Provide a list of the references cited in the SEIS.

In addition, the reviewer should coordinate the SAMA review for the SEIS with reviewers for the following:

- 10 CFR 50.34(f)(1)(I). Coordinate with the responsible 10 CFR 50.34(f)(1)(I) reviewer to ensure consistency of the SAMA and the 10 CFR 50.34(f)(1)(I) reviews if available.
- Internal Plant Examination (IPE). Coordinate with the responsible reviewer (or review branch) for the IPE to ensure consistency of the SAMA analysis with the findings of the IPE.
- Internal Plant Examination of External Events (IPEEE). Coordinate with the responsible reviewer (or review branch) for the IPEEE to ensure consistency of the SAMA analysis with the results of the IPEEE.
- Safety Analysis Report (SAR), Chapter 19 Review. Coordinate with the responsible reviewer (or review branch) for Chapter 19 of the SAR to ensure consistency of the SAMA analysis with the results of the SAR Chapter 19 review, if available.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors. The following data or information may be needed:

- a list of leading contributors to (1) core-damage frequency (e.g., from dominant severe accident sequences or initiating events), (2) large-release frequency (e.g., from containment failure mode or accident progression bin), and (3) dose consequences with and without interdiction (e.g., from each release class and associated source term) (from the environmental report [ER])
- the applicant's description of the methodology, process, and rationale used by the applicant to identify, screen, and select alternatives (from the ER)
- the estimated cost, risk reduction, and value-impact ratios for the selected SAMAs and the assumptions used to make these estimates (from the ER)

- a description and list of any alternatives that have been or will be implemented to prevent or mitigate severe accidents or reduce the risk of a severe accident (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the analysis and evaluation of SAMAs are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c)(3)(ii)(L) with respect to the need to consider alternatives to mitigate severe accidents for the applicant's plant if SAMAs were not previously considered
- 10 CFR 51.70(b) with respect to permitting an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51, Subpart A, Appendix B, Table B-1, with respect to the definition of the issue to be addressed.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999a) provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- NUREG/BR-0058, Rev. 2, *Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission*. Final Report (NRC 1997a) states the policy for the preparation and the contents of regulatory analyses, including estimation of values and impacts for alternatives and the "dollars per person-rem" conversion factors.
- NUREG/BR-0184, *Regulatory Analysis Technical Evaluation Handbook* (NRC 1997b) provides guidance with respect to the value impact methodology.
- NUREG/CR-6349 (Mubayi et al. 1995) provides information with respect to dollars per person-rem conversion factor for offsite damage costs.
- Generic Letter 88-20 (NRC 1988) provides guidance with respect to the performance of an IPE at operating plants for severe accident vulnerabilities.
- Generic Letter 88-20, Supplement 3 (NRC 1990) provides guidance with respect to accident prevention and mitigation features identified in the Containment Performance Improvement Program that may be valid for consideration in the review of SAMAs.

- Generic Letter 88-20, Supplement 4 (NRC 1991b) provides guidance with respect to conducting an individual plant examination for externally initiated events.
- Interim Policy Statement, “Power Plants—Nuclear Power Plant Accident Considerations under NEPA” (1980) provides guidance with respect to the early consideration of either additional features or other actions that would prevent or mitigate the consequences of serious accidents.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b) provides guidance on preparation of ERs associated with LR.
- SECY-91-229 (NRC 1991a) presents alternative courses of action and the staff’s recommendations concerning the treatment of the SAMA issues to be considered under NEPA as they relate to the certification of standard plants, including evolutionary, passive, and advanced reactors.

In addition, the following acceptance criterion is used:

- Completeness and reasonableness with respect to (1) the identification of SAMAs applicable to the plant under consideration, (2) the estimation of core damage frequency reduction and averted person-rem for each SAMA, (3) the estimation of cost for each SAMA, (4) the screening criteria to identify SAMAs for further consideration, and (5) the final disposition of promising SAMAs.

Technical Rationale

The technical rationale for evaluating the applicant’s SAMAs is discussed in the following paragraphs:

The SEIS should include an analysis of the SAMAs for the applicant’s plant if they have not previously been considered in an EIS or related supplement or in an environmental assessment. The purpose of SAMAs is to review and evaluate plant design alternatives and procedural changes that could significantly reduce the radiological risk from a severe accident by preventing substantial core damage (i.e., preventing a severe accident) or by limiting releases from containment in the event that substantial core damage occurs (i.e., mitigating the impacts of a severe accident).

In 1980, the NRC published an interim policy statement (Interim Policy Statement, “Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969” [NRC 1980]) that stated that it was the intent of the Commission for the staff to take steps to identify additional cases that might warrant early consideration of either additional features or other actions that would prevent or mitigate the consequences of serious accidents.

In 1985, the NRC published a policy statement (“Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants,” August 9, 1985 [NRC 1985a]). It concluded that existing plants posed no undue risk to public health and safety and that there is no present basis for immediate action on generic rulemaking or other regulatory changes for these plants because of

severe-accident risk. However, the policy statement indicated that “the Commission plans to formulate an approach for a systematic safety examination of existing plants to determine whether particular accident vulnerabilities are present and what cost-effective changes are desirable to ensure that there is no undue risk to public health and safety.”

A 1989 court decision (*Limerick Ecology Action vs. NRC*, 869 F.2d 719 [3rd Cir. 1989]) stated that the “Action of NRC in addressing SAMDAs through policy statements, not rule making, did not satisfy NEPA, where policy statements did not represent requisite careful consideration of environmental consequences, excluded consideration of design alternatives without making any conclusions about effectiveness of any particular alternative, and issues were not generic in that impact of SAMDAs on environment would differ with a particular plant’s design, construction and locations.” NRC considers the evaluation of SAMAs in the environmental impact review that is performed as part of every application for a LR if SAMAs have not been considered for the plant.

III. REVIEW PROCEDURES

Suggested steps for conducting the review are as follows:

- (1) Review the discussion of severe accidents and SAMAs in the NUREG-1437.
- (2) Determine if the staff previously considered SAMAs for the applicant’s plant in an EIS or related supplement or in an environmental assessment. If not, then continue the analysis at Step (3). Otherwise, prepare a statement for the SEIS that describes the SAMA analysis and identifies the location of the analysis.
- (3) Become familiar with analyses, the process, and design alternatives considered in previous studies, including the following:
 - Limerick, Letter from U.S. NRC to G. A. Hunger, Jr. Philadelphia Electric Company. Subject: Supplement to the Final Environmental Statement-Limerick Generating Station, Units 1 and 2. Supplement to NUREG-0974” (NRC 1989).
 - Watts Bar (NUREG-0498), *Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2*. (NRC 1995).
 - 10 CFR 50.34(f)(1)(I) reviews of the System 80+, “Contents of application; technical information” (NRC 1997c).
 - the Advanced Boiling-Water Reactor (ABWR), “Final Environmental Assessment by the Office of Nuclear Reactor Regulation” (NRC 1997c).
 - the GESSAR II, “*Safety Evaluation Report Related to the Final Design Approval of the GESSAR II BWR/6 Nuclear Island Design*” (NRC 1985b)

- the Containment Improvement Program
- Generic Environmental Impact Statement for License Renewal (NUREG-1437).

(4) Evaluate the applicant's methods for identifying the potential mitigation alternatives. If the applicant used an alternative methodology to a probabilistic risk assessment approach to assess potential SAMAs (for example, a margins-based approach to evaluate external events initiated by fires or seismic activity), the staff evaluation should be appropriately modified. For example, the synergistic effects of mitigation alternatives that reduce risks for internally initiated events that also provide a benefit for mitigation of externally initiated events should be considered. Alternative benefit-cost approaches are appropriate when a margins method has been used to screen external events.

- Determine if this set of potential alternatives represents a reasonable range of preventive and mitigative alternatives.
 - Verify that the applicant's list of potential SAMAs includes a reasonable range of applicable SAMAs derived from consideration of previous analyses and based on insights from the Level 1 and Level 2 portions of the applicant's probabilistic risk assessment (PRA) or IPE/IPEEE.
- Evaluate the applicant's basis for estimating the degree to which various alternatives would reduce risk (expressed as a reduction in core-damage frequency or in terms of person-rem averted). In performing its independent assessment, the staff may make bounding assumptions to determine the magnitude of the potential risk reduction for each SAMA.
 - Evaluate whether the applicant's cost estimates for each SAMA are reasonable, and compare the cost estimates with estimates developed elsewhere (e.g., using previous SAMA evaluations or using accepted cost-estimation tools).
 - Evaluate the benefit-cost comparison to determine if it is consistent with the benefit-cost balance criteria and methodology given in NUREG/BR-0058, Rev. 2, *Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission, Final Report* (NRC 1997a), and further analyze any SAMAs that are within a decade of the NUREG/BR-0058, Rev. 2, or NUREG/CR-6349 (Mubayi et al. 1995) benefit-cost criteria to ensure that a sufficient margin is present to account for uncertainties in assumptions used to determine the cost and benefit estimates. The benefit-cost criterion in NUREG/BR-0058 is \$200,000 per person-sievert averted (\$2000 per person-rem averted) for health effects. In addition, a criterion of \$300,000 per person-sievert averted (\$3000 per person-rem averted) is given in NUREG/CR-6349 (Mubayi et al. 1995) for offsite damage and other related costs for severe accidents.
 - Subject any SAMAs that remain following the screening given above to further probabilistic and deterministic considerations, including a qualitative assessment of the following:

- the impact of additional benefits that could accrue for the SAMA if it would be effective in reducing risk from certain external events, as well as internal events
 - the effects of improvements already made at the plant
 - any operational disadvantage associated with the potential SAMA.
- (9) Prepare a statement for the SEIS that describes the applicant's analysis and details the staff's review process. Any mitigation should be described along with the estimated benefit-cost ratio. The risk reduction for the facility should be provided. The statement for the SEIS should identify and describe the mitigative measures considered and committed to by the applicant.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the applicant's SAMA analysis. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

When the reviewer determines that the staff previously considered SAMAs for the applicant's plant in an EIS or related supplement or in an environmental assessment, then the reviewer should provide a statement for the SEIS similar to the following:

SAMAs for the applicant's plant were previously considered by the staff in ____ (provide reference for document). The analysis was based on the licensee's analysis in ____ (provide reference for document). The staff has concluded that the applicant completed a comprehensive, systematic effort to identify and evaluate the potential plant enhancements to mitigate the consequences of severe accidents. The staff has considered the robustness of this conclusion relative to critical assumptions in the analysis—specifically the impact of uncertainties in the risk and cost estimates and the use of alternative benefit-cost screening criteria. The staff has concluded that the findings of the analysis would be unchanged even considering these factors. Therefore, the staff concludes that the mitigation alternatives committed to by the applicant are appropriate, and no further mitigation measures are warranted.

If the reviewer determines that there was no previous consideration of SAMAs for the plant, then the reviewer should prepare a statement for the SEIS similar to the following:

The staff has concluded that the applicant completed a comprehensive, systematic effort to identify and evaluate the potential plant enhancements to mitigate the consequences of severe accidents. The staff has considered the robustness of this conclusion relative to critical assumptions in the analysis—specifically the impact of uncertainties in the averted offsite risk estimates and the use of

alternative benefit-cost screening criteria. The staff has concluded that the findings of the analysis would be unchanged even considering these factors. Therefore, the staff concludes that the mitigation alternatives committed to by the applicant are appropriate, and no further mitigation measures are warranted.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 50.34, "Contents of application; technical information."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

Limerick Ecology Action vs. NRC 869 F. 2D 719 [3rd Cir. 1989]

Mubayi, V., V. Sailor, and G. Anandalingam. 1995. *Cost-Benefit Considerations in Regulatory Analysis*. NUREG/CR-6349, U.S. Nuclear Regulatory Commission, Washington, D.C.

U.S. Nuclear Regulatory commission (NRC). 1985a. Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants." 50 FR 32138, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1985b. *Safety Evaluation Report Related to the Final Design Approval of the GESSAR II BWR/6 Nuclear Island Design*." NUREG-0979, Supplement 4, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1988. Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities." November 23, 1988, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1989. Letter from U.S. NRC to G. A. Hunger, Jr. Philadelphia Electric Company. Subject: Supplement to the Final Environmental Statement—Limerick Generating Station, Units 1 and 2. Supplement to NUREG-0974.

U.S. Nuclear Regulatory Commission (NRC). 1990. Generic Letter 88-20, Supplement 3, “Completion of Containment Performance Improvement Program and Forwarding Insights for Use in the Individual Plant Examination for Severe Accident Vulnerabilities.” July 6, 1990, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1991a. “Severe Accident Mitigation Design Alternatives for Certified Standard Designs.” SECY-91-229, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1991b. Generic Letter 88-20, Supplement 4, “Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities - 10 CFR 50.54(f).” June 28, 1991, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1995. *Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2*. NUREG-0498, Suppl. 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1997a. *Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission. Final report.* NUREG/BR-0058, Rev. 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1997b. *Regulatory Analysis Technical Evaluation Handbook.* NUREG/BR-0184, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1997c. *Final Environmental Assessment by the Office of Nuclear Reactor Regulation.* Relating to the Certification of the System 80+ Standard Nuclear Plant Design. NUREG-1462, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1997d. *Final Environmental Assessment by the Office of Nuclear Reactor Regulation.* Relating to the Certification of the U.S. Advanced Boiling Water Reactor Design. NUREG-1503, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*, Washington, D.C.



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5.2 SIGNIFICANT NEW INFORMATION ON IMPACTS OF POSTULATED ACCIDENTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of significant new information related to the potential environmental impacts of postulated plant accidents during the renewal term and preparation of a section that introduces the supplemental environmental impact statement (SEIS) sections that present analyses of environmental issues for which there is significant new information.

The scope of the review directed by this plan includes (1) preparation of a consolidated list of environmental issues related to postulated accidents for which there is significant new information, (2) preparation of an introduction for SEIS sections presenting the staff's analyses related to those issues, or (3) preparation of a short section for the SEIS stating that there are no issues related to the environmental impacts of postulated accidents for which there is significant new information.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 5.1. Obtain a list of environmental issues related to postulated accidents during the renewal term for which there is significant new information.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 5.3. Provide a summary of the reviews conducted and conclusions reached.
- ESRP/S1 5.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- list of environmental issues related to postulated accidents during the renewal term for which there is significant new information (from reviewers of ESRP/S1 5.1)
- organizational structure of the SEIS (from the Environmental Project Manager).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of postulated accidents are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment and with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71(d) with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999) provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating significant new information is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information. The review conducted under this ESRP leads to preparation of a section of the SEIS that introduces the sections that provide the staff's analysis of significant new information, if any, related to the environmental impacts of postulated accidents during the renewal term.

III. REVIEW PROCEDURES

The reviewer should contact the reviewer for ESRP/S1 5.1 for a list of environmental issues for which there is significant new information in an environmental impact statement (EIS) prepared at the LR stage. If there is no issue for which there is significant new information, then the reviewer should prepare a statement to that effect for the SEIS that is similar to the statement developed for the review for ESRP/S1 5.1. Otherwise, the reviewer should prepare one or more paragraphs for the SEIS introducing the SEIS sections that present the findings of the analyses on the issues for which there is significant new information.

If there is no issue for which there is significant new information, the SEIS statement should make the following points:

- There has been a search for new information on environmental impacts of postulated accidents.
- The significance of any new information, if any, has been assessed.
- There is no issue for which there is significant new information.

If there are issues for which there is significant new information, each issue should be addressed in a separate SEIS section. The introductory paragraphs prepared under this ESRP should identify the issue and direct the reader to the SEIS section in which the issue is addressed.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare an SEIS section that either states that there is no issue for which there is significant new information or introduces the SEIS sections that discuss the issues for which there is significant new information.

If there is no issue for which there is significant new information, the reviewer should prepare a paragraph for the SEIS similar to the following:

The staff has reviewed the discussion of the environmental impacts of postulated accidents in NUREG-1437 and in the applicant's environmental report and conducted their own independent review. In this process, the staff did not discover any issue for which there is significant new information.

If there are issues for which there is significant new information, the review should prepare introductory paragraphs for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts of postulated accidents during the renewal term in NUREG-1437 and in the applicant's environmental report and conducted its own independent review. In this process, the staff has determined that there is significant new information related to ____ and ____ that has potentially adverse impacts. Section ____ of this SEIS describes the issue, gives the staff's analysis, and discusses mitigation alternatives for _____. Section _____ covers _____.

Where appropriate, a statement similar to the following should be inserted in the SEIS sections dealing with significant new information:

_____ is a part of the Category 1 issue related to _____. Reconsideration of the conclusions for this issue is limited in scope to the assessment of the relevant new and significant information. The scope does not include review of other facets of the issue that are not affected by the new information.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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5.3 SUMMARY OF IMPACTS OF POSTULATED ACCIDENTS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section for the supplemental environmental impact statement (SEIS) that summarizes conclusions related to the environmental impacts of postulated accidents during the renewal term.

The scope of the review directed by this plan covers the collection of summary statements prepared by reviewers of supplemental ESRPs (ESRP/S1s) 5.1, 5.1.1, and 5.2 and consolidation of the summary statements in an SEIS section that addresses collective as well as individual environmental impacts.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1s 5.1, 5.1.1, and 5.2. Obtain summary statements that succinctly give conclusions reached in the staff reviews.

Data and Information Needs

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

The kinds of data and information needed will be affected by site- and station-specific factors; the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The reviewer for this ESRP should obtain summary statements from reviewers of ESRP/S1s 5.1, 5.1.1, and 5.2.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of postulated accidents are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.

Technical Rationale

The technical rationale for providing a summary of conclusions at the end of the SEIS chapter is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. A summary of conclusions reached is presented at the end of each chapter in NUREG-1437. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 5.1, 5.1.1, and 5.2 and compile a list of conclusions from the SEIS sections that the reviewers have prepared. The conclusions should be checked for completeness and prepared for inclusion in the SEIS. The reviewer should consult with other reviewers for the ESRPs in Chapter 5 to evaluate the collective impact of impacts that are individually of small significance. The reviewer for this ESRP should then prepare a statement related to the collective impact of impacts related to postulated accidents during the renewal term that are individually of small significance. The conclusions should not contain references.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists the conclusions of the SEIS sections covering changes in environmental impacts resulting from postulated

accidents during the LR term and the conclusion related to the collective impact of impacts that were determined individually to be of small significance. The completed list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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5.4 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of the section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on environmental impacts of postulated accidents during the license renewal (LR) term.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 5.0 through 5.2. Obtain lists of references cited in SEIS sections prepared by the reviewers

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The environmental standard review plans are keyed to Preparation of Environmental Reports for Nuclear Power Stations.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. In NUREG-1437, reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 5.0 through 5.2 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering changes in the environmental impacts of postulated accidents during the LR term. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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5.4-1

NUREG-1555, Supplement 1

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The environmental standard review plans are keyed to Preparation of Environmental Reports for Nuclear Power Stations.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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6.0 THE URANIUM FUEL CYCLE AND SOLID WASTE MANAGEMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes environmental impacts of the uranium fuel cycle and solid waste management during the renewal term.

The scope of the paragraphs covered by this plan introduces the material from the reviews conducted under supplemental ESRPs (ESRP/S1s) 6.1 and 6.2. It includes the description of the environmental issues associated with the uranium fuel cycle and solid-waste management discussed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996; NRC 1999a).

Review Interfaces

The reviewer should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 6.1. Obtain a list of environmental issues related to the uranium fuel cycle and solid waste management during the renewal term for which there is new and significant information that are applicable to the plant, if any.
- ESRP/S1 6.2. Provide a list of environmental issues related to the uranium fuel cycle and solid waste

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management during the renewal term for which there is significant new information.

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- ESRP/S1 6.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP should obtain the organizational structure of the SEIS from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (DEIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of DEIS at the license renewal (LR) stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the LR stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996, NRC 1999a), provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999b), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for providing introductory paragraphs related to the potential environmental impacts of the uranium fuel cycle and solid waste management during the renewal term is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required. The environmental issues associated with the uranium fuel cycle and solid waste management during the renewal term considered in NUREG-1437 that were determined to be Category 1 issues are listed in the following table:

| ISSUE—10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Sup 1 Sections |
|---|----------|--|------------------------------|
| URANIUM FUEL CYCLE AND WASTE MANAGEMENT | | | |
| Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high- level waste) | 1 | 6.1 6.2.1 6.2.2.1 6.2.2.3 6.2.3 6.2.4 6.6 | 6.1 |
| Offsite radiological impacts (collective effects) | 1 | 6.1 6.2.2.1 6.2.3 6.2.4 | 6.1 |
| Offsite radiological impacts (spent fuel and high-level waste disposal) | 1 | 6.1 6.2.2.1 6.2.3 6.2.4 | 6.1 |
| Nonradiological impacts of the uranium fuel cycle | 1 | 6.1 6.2.2.6 6.2.2.7 6.2.2.8 6.2.2.9 6.2.3 6.2.4 6.6 | 6.1 |

| ISSUE—10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Sup 1 Sections |
|--|-----------------|--|--------------------------------------|
| Low-level waste storage and disposal | 1 | 6.1 6.2.2.2 6.4.2 6.4.3 6.4.3.1 6.4.3.2 6.4.3.3 6.4.4 6.4.4.1 6.4.4.2 6.4.4.3 6.4.4.4 6.4.4.5 6.4.4.5.1 6.4.4.5.2 6.4.4.5.3 6.4.4.5.4 6.4.4.6 | 6.1 |
| Mixed waste storage and disposal | 1 | 6.4.5.1 6.4.5.2 6.4.5.3 6.5.5.4 6.4.5.5 6.4.5.6 6.4.5.6.1 6.4.5.6.2 6.4.5.6.3 6.4.5.6.4 | 6.1 |
| Onsite spent fuel | 1 | 6.1 6.4.6 6.4.6.1 6.4.6.2 6.4.6.3 6.4.6.4 6.4.6.5 6.4.6.6 6.4.6.7 6.6 | 6.1 |

| ISSUE—10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Sup 1 Sections |
|--|-----------------|--|--------------------------------------|
| Nonradiological waste | 1 | 6.1 6.5 6.5.1 6.5.2 6.5.3 6.6 | 6.1 |
| Transportation | 1 | 6.3.1 6.3.2.1 6.3.2.2 6.3.2.3 6.3.3 6.3.4 Addendum 1 | 6.1.1 |

Generic conclusions relative to impacts were reached for those issues that are appropriate for all plants, or for some issues to specific classes of plants. These conclusions were that (1) a single level of significance could be assigned to the impact and (2) plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. In the absence of new and significant information, these issues may be addressed in the SEIS without additional plant-specific analysis.

If there is new and significant information related to uranium fuel cycle and solid waste management during the renewal term identified by the applicant, by the public, or by the staff, the reviewer for this ESRP should prepare a table that directs readers to the SEIS sections dealing with the issues.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/SEIS 6.1 and 6.2. The paragraph(s) should list the types of information to be presented and describe their relationships to information presented earlier and to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, “Postconstruction environmental reports.”

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements”

10 CFR 51 Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437 Vol. 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission. 1999b. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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6.1 THE URANIUM FUEL CYCLE AND SOLID WASTE MANAGEMENT

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of environmental impacts of the uranium fuel cycle and solid waste management and preparation of input to the supplemental environmental impact statement (SEIS). These issues are discussed in Chapter 6 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996; NRC 1999a).

The scope of the review directed by this plan includes (1) review of the discussion of the uranium fuel cycle and solid waste management in NUREG-1437, (2) identification and evaluation of new information related to the uranium fuel cycle and solid-waste management during the renewal term for significance, and (3) preparation of input to the SEIS that disposes the Category 1 issues.

Impacts of the uranium fuel cycle and solid-waste management during the renewal term related to

- offsite radiological impacts (individual and collective effects)
- offsite radiological impacts (spent fuel and high-level waste disposal)
- nonradiological impacts of the uranium fuel cycle
- low-level waste storage and disposal
- mixed waste storage and disposal
- onsite spent fuel
- nonradiological waste
- transportation

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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are Category 1 issues. There are no Category 2 issues related to the uranium fuel cycle and solid waste management.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRPs/S1s:

- ESRP/S1 6.2. Provide a list of environmental issues, if any, related to the uranium fuel cycle and solid waste management during the renewal term for which there is significant new information.
- ESRP/S1 6.3. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 6.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on environmental issues related to the uranium fuel cycle and solid waste management during the renewal term (from the environmental report [ER])
- new information on the uranium fuel cycle and solid waste management during the renewal term known to the applicant (from the ER)
- new and potentially significant information on the uranium fuel cycle and solid waste management identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of the uranium fuel cycle and solid waste management are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the license renewal (LR) stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment

- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft environmental impact statement (EISs) at the LR stage
- 10 CFR 51.95(c)(4) with respect to contents of SEIS and consideration of significant new information
- 10 CFR 51 Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996; 1999a) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required. Addendum 1 provides the staff's analysis of the potential cumulative environmental impacts of transporting spent nuclear fuel in the vicinity of a single high-level waste repository, and summarizes the staff's analyses undertaken to determine whether the environmental impacts of the transportation of higher enrichment and higher burnup fuel spent nuclear fuel are consistent with the values of 10 CFR 51.52, Table S-4.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999b), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999c), provides guidance on preparation of ERs associated with LR

Technical Rationale

The technical rationale for evaluating the applicant's description of the uranium fuel cycle and solid-waste management is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions from NUREG-1437 related to the uranium fuel cycle and solid waste management, as appropriate, and address significant new information, if any.

III. REVIEW PROCEDURES

The review of the uranium fuel cycle and solid waste management during the renewal term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the issue in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table lists the uranium fuel cycle and solid waste management issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--|
| URANIUM FUEL CYCLE AND WASTE MANAGEMENT | | |
| Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high-level waste) | 1 | 6.1 6.2.1 6.2.2.1 6.2.2.3 6.2.3 6.2.4 6.6 |
| Offsite radiological impacts (collective effects) | 1 | 6.1 6.2.2.1 6.2.3 6.2.4 |
| Offsite radiological impacts (spent fuel and high-level waste disposal) | 1 | 6.1 6.2.2.1 6.2.3 6.2.4 |
| Nonradiological impacts of the uranium fuel cycle | 1 | 6.1 6.2.2.6 6.2.2.7 6.2.2.8 6.2.2.9 6.2.3 6.2.4 6.6 |

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|----------|--|
| Low-level waste storage and disposal | 1 | 6.1 6.2.2.2 6.4.2 6.4.3 6.4.3.1 6.4.3.2 6.4.3.3 6.4.4 6.4.4.1 6.4.4.2 6.4.4.3 6.4.4.4 6.4.4.5 6.4.4.5.1 6.4.4.5.2 6.4.4.5.3 6.4.4.5.4 6.4.4.6 |
| Mixed waste storage and disposal | 1 | 6.4.5.1 6.4.5.2 6.4.5.3 6.5.5.4 6.4.5.5 6.4.5.6 6.4.5.6.1 6.4.5.6.2 6.4.5.6.3 6.4.5.6.4 |
| Onsite spent fuel | 1 | 6.1 6.4.6 6.4.6.1 6.4.6.2 6.4.6.3 6.4.6.4 6.4.6.5 6.4.6.6 6.4.6.7 6.6 |

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|----------|---|
| Nonradiological waste | 1 | 6.1 6.5 6.5.1 6.5.2 6.5.3 6.6 |
| Transportation | 1 | 6.1 6.3.1 6.3.2.3 6.3.3 6.3.4 6.6 Addendum1 |

(2) Determine if there is new information on this issue that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information, if it existed?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analyses leading to NUREG-1437?
- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

(3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare the section for SEIS describing the search for new information, summarizing the new information found, presenting the results of evaluation of significance, and adopting the conclusion from NUREG-1437.

- (4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting conclusions from NUREG-1437, modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in the SEIS for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach conclusions on issues related to the uranium fuel cycle and solid waste management during the renewal term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs.

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high level waste): Based on information in the GEIS, the Commission found that

“Off-site impacts of the uranium fuel cycle have been considered by the Commission in Table S-3 of this part [10 CFR 51.51(b)]. Based on information in the GEIS, impacts on individuals from radioactive gaseous and liquid releases including radon-222 and technetium-99 are small”.

The staff has not identified any significant new information during its independent review of the BGE ER, the staff's site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information. Therefore, the staff concludes that there are no offsite radiological impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

(a) Include this phrase only in the final SEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high level waste): Based on information in the GEIS, the Commission found that

“Off-site impacts of the uranium fuel cycle have been considered by the Commission in Table S-3 of this part [10 CFR 51.51(b)]. Based on information in the GEIS, impacts on individuals from radioactive gaseous and liquid releases including radon-222 and technetium-99 are small”.

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to the off-site impacts of the uranium fuel cycle has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in the GEIS. Therefore, the staff concludes that there are no off-site impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Offsite radiological impacts (individual effects from other than the disposal of spent fuel and high level waste): Based on information in the GEIS, the Commission found that

“Off-site impacts of the uranium fuel cycle have been considered by the Commission in Table S-3 of this part [10 CFR 51.51(b)]. Based on information in the GEIS, impacts on individuals from radioactive gaseous and liquid releases including radon-222 and technetium-99 are small”.

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to the off-site impacts of the uranium fuel cycle has been identified

(List)

-
- (a) Include this phrase only in the final SEIS.
 - (b) Include this phrase only in the final SEIS.

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g. 6.2.1, 6.2.2, etc.])

The staff has determined that the remaining information does not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no off-site impacts of the uranium fuel cycle during the renewal term beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

10 CFR 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3—Transportation, Table 9.1 Summary of*

findings on NEPA issues for license renewal of nuclear power plants. NUREG-1437 Vol. 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants.* NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999c. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.* Washington, D.C.



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**6.2 SIGNIFICANT NEW INFORMATION ON THE URANIUM FUEL CYCLE AND SOLID
WASTE MANAGEMENT**

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of significant new information related to the uranium fuel cycle and solid-waste management and preparation of a section for the supplemental environmental impact statement (SEIS) that introduces the sections that present the staff analyses of these issues.

The scope of the review directed by this plan includes (1) preparation of a consolidated list of environmental issues related to the uranium fuel cycle and solid waste management for which there is significant new information, (2) preparation of an introduction to SEIS sections presenting the staff's analyses related to those issues, or (3) preparation of a short section for the SEIS stating that there are no issues related to the environmental impacts of the uranium fuel cycle and solid waste management for which there is significant new information.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 6.1. Obtain a list of environmental issues related to the uranium fuel cycle and solid waste management during the renewal term for which there is significant new information.
- ESRP/S1 6.3. Provide a summary of the reviews conducted and conclusions reached.
- ESRP/S1 6.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- list of environmental issues related to the uranium fuel cycle and solid waste management during the renewal term for which there is significant new information (from reviewers of ESRP/S1 6.1)
- organizational structure of the SEIS (from the Environmental Project Manager).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of the uranium fuel cycle and solid waste management are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of ERs and required analyses
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment and with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71(d) with respect to compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.

- NRC Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the significant new information is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of a section of the SEIS that introduces the staff's analyses of significant new information, if any.

III. REVIEW PROCEDURES

The reviewer should contact the reviewer for ESRP/S1 6.1 for a list of environmental issues related to the uranium fuel cycle and solid-waste management during the renewal term for which there is significant new information. If there is no issue for which there is significant new information, then the reviewer should prepare a statement to that effect for the SEIS. Otherwise, the reviewer should prepare one or more paragraphs for the SEIS introducing the SEIS sections that present the findings of the analyses on the issues for which there is significant new information.

If there is no issue for which there is significant new information, the SEIS statement should make the following points:

- there has been a search for new information on the uranium fuel cycle and solid waste management
- the significance of any new information, if any, has been assessed
- there is no issue for which there is significant new information.

If there are issues for which there is significant new information, each issue should be addressed in a separate SEIS section. The introductory paragraphs prepared under this ESRP should identify the issue and direct the reader to the SEIS section where the issue is addressed.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare an SEIS section that either states that there is no issue for which there is significant new information or introduces the SEIS sections that discuss the issues for which there is significant new information.

If there is no issue for which there is significant new information, the reviewer should prepare a paragraph for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts of the uranium fuel and solid waste management associated with operation during the renewal term in NUREG-1437 and in the applicant's environmental report and conducted its own independent review. In this process, the staff did not discover any issue for which there is significant new information.

If there are issues for which there is significant new information, the review should prepare introductory paragraphs for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts of the uranium fuel cycle and solid waste management in NUREG-1437 and in the applicant's environmental report and conducted its own independent review. In this process, the staff has determined that there is significant new information related to ____ and _____. Section ____ of this SEIS describes the issue, gives the staff's analysis, and discusses mitigation alternatives for _____. Section _____ covers _____.

Where appropriate, a statement similar to the following should be inserted in the SEIS sections dealing with significant new information:

_____ is a part of the Category 1 issue related to _____. Reconsideration of the conclusions for this issue is limited in scope to the assessment of the relevant new and significant information. The scope does not include review of other facets of the issue that are not affected by the new information.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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**6.3 SUMMARY OF IMPACTS OF URANIUM FUEL CYCLE AND SOLID WASTE
MANAGEMENT**

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section for the supplemental environmental impact statement (SEIS) that summarizes conclusions related to environmental impacts of the uranium fuel cycle and solid waste management during the renewal term.

The scope of the review directed by this plan covers the collection of summary statements prepared by reviewers of supplemental ESRPs (ESRP/S1s) 6.1 and 6.2 and consolidation of the summary statements in an SEIS section that addresses collective as well as individual environmental impacts.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1s 6.1 and 6.2. Obtain summary statements that succinctly give conclusions reached in the staff reviews.

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The reviewer for this ESRP should obtain summary statements from reviewers of ESRP/S1s 6.1 and 6.2.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of postulated accidents are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft EIS that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.

Technical Rationale

The technical rationale for providing a summary of conclusions at the end of the SEIS chapter is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. A summary of conclusions reached is presented at the end of each chapter in NUREG-1437. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 6.1 and 6.2 and compile a list of conclusions from the SEIS sections that the reviewers have prepared. The conclusions should be checked for completeness and prepared for inclusion in the SEIS. The reviewer should consult with other reviewers for the ESRPs in Chapter 6 to evaluate the collective impact of impacts that are individually of small significance. The reviewer for this ESRP should then prepare a statement related to the collective impact of impacts related to the uranium fuel cycle and solid waste management during the renewal term that are individually of small significance. The conclusions should not contain references.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists the conclusions of the SEIS sections covering changes in environmental impacts of the uranium fuel cycle and solid waste management during the renewal term. The completed list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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6.4 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on environmental impacts of the uranium fuel cycle and solid waste management.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 6.0 through 6.2. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas in which additional plant-specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. In NUREG-1437, reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1s 6.0 through 6.2 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering changes in the environmental impacts of the uranium fuel cycle and solid waste management. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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7.0 DECOMMISSIONING

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes the potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term.

The scope of the paragraphs covered by this plan introduces the material from the reviews conducted under supplemental ESRPs (ESRP/S1s) 7.1 and 7.2. It includes descriptions of the environmental issues associated with decommissioning discussed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996). All environmental issues related to decommissioning are Category 1 issues.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1 7.1. Obtain a list of environmental issues related to the changes in the impacts of decommissioning resulting from continued operation during the renewal term, if any, that are applicable to the plant for which there is new and significant information.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 7.2. Provide a list of the environmental issues related to the changes in the impacts of decommissioning resulting from continued operation during the renewal term, if any, that are applicable to the plant for which there is significant new information.
- ESRP/S1 7.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP should obtain the organizational structure of the SEIS from the Environmental Project Manager.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of postconstruction environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of draft EIS at the license renewal (LR) stage
- 10 CFR 51.95(c) with respect to preparation of a final postconstruction EIS at the LR stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999) provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating potential changes in the environmental impacts of decommissioning resulting from continued operation during the renewal term is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation.

III. REVIEW PROCEDURES

The material to be prepared is informational in nature, and no specific analysis of data is required. Environmental issues associated with decommissioning resulting from continued plant operation during the renewal term were considered in NUREG-1437. The issues, which were determined to be Category 1 issues, are listed in the following table:

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections | NUREG-1555 Sup 1 Sections |
|---|-----------------|----------------------------|----------------------------------|
| DECOMMISSIONING | | | |
| Radiation doses | 1 | 7.3.1 7.4 | 7.1 |
| Waste management | 1 | 7.3.2 7.4 | 7.1 |
| Air quality | 1 | 7.3.3 7.4 | 7.1 |
| Water quality | 1 | 7.3.4 7.4 | 7.1 |
| Ecological resources | 1 | 7.3.5 7.4 | 7.1 |
| Socioeconomic impacts | 1 | 7.3.7 7.4 | 7.1 |

Generic conclusions relative to impacts were reached for those issues that are appropriate for all plants, or for some issues for specific classes of plants. These conclusions were that (1) a single level of significance could be assigned to the impact, and (2) plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. In the absence of new and significant information, these issues may be addressed in the SEIS without additional plant-specific analysis.

If there is new and significant information related to changes in the environmental impacts associated with decommissioning caused by LR identified by the applicant, by the public, or by the staff, the reviewer for this ESRP should prepare a table that directs readers to the SEIS sections dealing with issues where the impacts change.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/S1s 7.1 and 7.2. The paragraph(s) should list the types of information to be presented and describe their relationships to information presented earlier and to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant"

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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7.1 CHANGES IN DECOMMISSIONING IMPACTS RESULTING FROM LEASE RENEWAL

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of environmental impacts of decommissioning related to life extension and preparation of input to the supplemental environmental impact statement (SEIS).

The scope of the review directed by this plan includes (1) review of the discussion of decommissioning and the potential changes in the environmental impacts of decommissioning resulting from continued operation during the renewal term in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), (2) identification and evaluation of new information (if any) related to potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term for significance, and (3) preparation of input to the SEIS.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1 7.2. Provide a list of environmental issues related to changes in decommissioning impacts resulting from continued operation during the renewal term, if any, for which there is significant new information.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 7.3. Provide a summary of the review conducted and conclusions reached.
- ESRP/S1 7.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- a description of the applicant's process for identifying new and potentially significant information on environmental issues related to changes in decommissioning impacts resulting from continued operation during the renewal term (from the environmental report [ER] or discussions with the licensee)
- new information on the environmental issues related to changes in decommissioning impacts resulting from continued operation during the renewal term known to the applicant (from the ER)
- new and potentially significant information on the changes in environmental impacts of decommissioning resulting from operation during the renewal term identified by the public.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of changes in environmental impacts of decommissioning resulting from continued operation during the renewal term are based on the relevant requirements of the following regulations:

- 10 CFR 51.45(b) with respect to environmental considerations in the applicant's ER
- 10 CFR 51.45(d) with respect to discussion of compliance with applicable environmental quality standards and requirements in the applicant's ER
- 10 CFR 51.53(c)(3)(ii) with respect to analyses required in ERs submitted at the license renewal (LR) stage
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment
- 10 CFR 51.71(d) with respect to content requirements that apply to analyses in draft EISs at the LR stage
- 10 CFR 51.95(c)(4) with respect to contents of SEIS and consideration of significant new information

- 10 CFR 51, Subpart A, Appendix B, with respect to findings on environmental issues for LR of nuclear power plants.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999), provides guidance to the staff on reviewing ERs associated with license applications under 10 CFR 50 and 52. It contains general review procedures that may be helpful in reviews for specific issues addressed in ERs associated with LR.
- Regulatory Guide 4.2, Supplement 1 provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of potential changes in environmental impacts of decommissioning resulting from continued operations during the renewal term is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 and any significant new information in an environmental impact statement (EIS) prepared at the LR stage. The review conducted under this ESRP leads to preparation of sections of the SEIS that incorporate the conclusions in NUREG-1437 related to changes in environmental impacts of decommissioning resulting from continued operation during the renewal term, as appropriate, and addresses significant new information, if any.

III. REVIEW PROCEDURES

The review of potential changes in the environmental impacts of decommissioning resulting from continued operation during the renewal term should be conducted in stages to permit termination when sufficient analysis has been completed to reach the appropriate conclusions. Suggested steps for the review process are as follows:

- (1) Review the discussion of the issue in NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff. The following table lists the decommissioning issues that were addressed in NUREG-1437 for which generic conclusions were reached.

| ISSUE -- 10 CFR 51, Subpart A, Appendix B, Table B-1 | Category | NUREG-1437 Sections |
|---|-----------------|--------------------------------|
| DECOMMISSIONING | | |
| Radiation doses | 1 | 7.3.1 7.4 |
| Waste management | 1 | 7.3.2 7.4 |
| Air quality | 1 | 7.3.3 7.4 |
| Water quality | 1 | 7.3.4 7.4 |
| Ecological resources | 1 | 7.3.5 7.4 |
| Socioeconomic impacts | 1 | 7.3.7 7.4 |

(2) Determine if there is new information on these issues that should be evaluated. The following sources of information should be included in the search for new information:

- the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
- records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Does the information post date the analysis leading to NUREG-1437?
- environmental quality standards and regulations. Have the applicable environmental quality standards and regulations changed since the analysis leading to NUREG-1437? If so, do the changes affect the NRC evaluation of applications for LR?
- the reviewer. During the site visit or review of applicable information has the reviewer become aware of new and significant information?

If the search conducted in this step reveals new information, then continue with Step (3). Otherwise, prepare the section for the SEIS describing the search for new information, stating the conclusion that there is none, and adopting conclusions from NUREG-1437.

- (3) Evaluate the significance of new information.

If new information is significant, then continue with Steps (4) and (5) of the review. Otherwise, prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of evaluation of significance, and adopting the conclusion from NUREG-1437.

- (4) Prepare concise statement(s) of the issues raised by significant new information and provide these statements to the Environmental Project Manager (EPM) for review and disposition. The EPM should assign a reviewer for each issue and ensure that the issues are addressed in subsections of Section 7.2 of the SEIS.
- (5) Prepare a section for the SEIS describing the search for new information, summarizing new information found, presenting results of the evaluation of significance, and adopting conclusions from NUREG-1437 modified as necessary to account for significant new information. Refer the reader to the appropriate subsection(s) in SEIS Section 7.2 for detailed evaluation(s) of the significant new information.

IV. EVALUATION FINDINGS

The depth and extent of the input to the SEIS will be governed by the extent of the analysis required to reach a conclusion related to the potential changes to environmental impacts of decommissioning resulting from continued operation during the renewal term. The information that should be included in the SEIS is described in the review procedures. Examples of statements that might be appropriate for inclusion in an SEIS are provided in the following paragraphs:

If no new information is discovered in the search process, a statement of the following type should be included in the SEIS for each Category 1 issue:

Radiation doses: Based on information in the GEIS, the Commission found that

“Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem [0.01 person-Sv] caused by buildup of long-lived radionuclides during the license renewal term.”

The staff has not identified any significant new information during its independent review of the _____ ER, the staff’s site visit, the scoping process, its review of public comments on the draft SEIS^(a), or its evaluation of other available information. Therefore, the staff concludes that there are no radiation doses associated with decommissioning following license renewal beyond those discussed in the GEIS.

-
- (a) Include this phrase only in the final SEIS.

If new information is discovered in the search process that is determined not to be significant, a statement of the following type should be included in the SEIS:

Radiation doses: Based on information in the GEIS, the Commission found that

“Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem [0.01 person-Sv] caused by buildup of long-lived radionuclides during the license renewal term.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(a), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to radiation doses associated with decommissioning following license renewal has been identified

(List)

After review of the information, the staff has determined that the new information is not significant because it does not lead to findings that are different from those in NUREG-1437. Therefore, the staff concludes that there are no impacts of radiation doses associated with decommissioning following license renewal beyond those discussed in the GEIS.

If significant new information is discovered in the search process, a statement of the following type should be included in the SEIS:

Radiation doses: Based on information in the GEIS, the Commission found that

“Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem [0.01 person-Sv] caused by buildup of long-lived radionuclides during the license renewal term.”

The staff independently reviewed the ____ ER, visited the site, conducted a scoping process, reviewed public comments on the draft SEIS^(b), and evaluated other available information, including reports of studies of the _____ performed for the _____. The following new information related to radiation doses associated with decommissioning following license renewal has been identified

(List)

-
- (a) Include this phrase only in the final SEIS.
 - (b) Include this phrase only in the final SEIS.

The staff has determined that (list) constitutes significant new information. Issues associated with this information are addressed in the following SEIS sections:

(List specific issue and SEIS section number [e.g. 7.2.1, 7.2.2, etc.])

The staff has determined that the remaining information did not constitute significant new information. Therefore, the staff concludes that, except as noted in the discussion of the significant new information, there are no impacts of radiation doses associated with decommissioning following license renewal beyond those discussed in the GEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR 51.45, "Environmental report."

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51 Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

10 CFR 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999a. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999b. Regulatory Guide 4.2, Supplement 1.
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**7.2 SIGNIFICANT NEW INFORMATION ON EFFECTS OF RENEWAL-TERM
OPERATIONS ON DECOMMISSIONING IMPACTS**

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review of significant new information related to the potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term and preparation of a section for the supplemental environmental impact statement (SEIS) that introduces the sections containing the analyses of these issues.

The scope of the review directed by this plan includes (1) preparation of a consolidated list of potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term for which there is significant new information, (2) introduction of SEIS sections presenting the staff's analyses related to those issues, or (3) preparation of a short section for the SEIS stating that there are no issues related to the environmental impacts of decommissioning for which there is significant new information.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 7.1. Obtain a list of issues related to changes in environmental impacts of decommissioning resulting from continued operation during the renewal term for which there is significant new information.
- ESRP/S1 7.3. Provide a summary of the reviews conducted and conclusions reached.
- ESRP/S1 7.4. Provide a list of the references cited in the SEIS.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the level of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- list of issues related to potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term for which there is significant new information (from reviewers of ESRP/S1 7.1)
- organizational structure of the SEIS (from the Environmental Project Manager).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of the environmental effects of license renewal on decommissioning are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to an independent evaluation of the assessment and the reliability of information used in the assessment and with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71(d) with respect to compliance with environmental-quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies
- 10 CFR 51.95(c)(4) with respect to consideration of significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the significant new information is discussed in the following paragraph:

The NRC staff is required by 10 CFR 51.95(c)(4) to integrate conclusions, as amplified by the supporting information in NUREG-1437, for issues designated as Category 1 or Category 2 and any significant new information in an EIS prepared at the LR stage. The review conducted under this ESRP leads to preparation of a section of the SEIS that introduces the staff's analysis of significant new information, if any, related to potential changes in environmental impacts resulting from continued operation during the renewal term.

III. REVIEW PROCEDURES

The reviewer should contact the reviewer for ESRP/S1 7.1 for a list of issues related to potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term for which there is significant new information. If there is no issue for which there is significant new information, then the reviewer should prepare a statement to that effect for the SEIS that is similar to the statements prepared by the reviewer for ESRP/S1 7.1. Otherwise, the reviewer should prepare one or more paragraphs for the SEIS introducing the SEIS sections that present the findings of the analyses on the issues for which there is significant new information.

If there is no issue for which there is significant new information, the SEIS statement should make the following points:

- There has been a search for new information on potential changes in the environmental impacts of decommissioning that are related to operation during the renewal term.
- The significance of any new information, if any, has been assessed.
- There is no issue for which there is significant new information.

If there are issues for which there is significant new information, each issue should be addressed in a separate SEIS section. The introductory paragraphs prepared under this ESRP should identify the issue and direct the reader to the SEIS section where the issue is addressed.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare an SEIS section that either states that there is no issue for which there is significant new information or introduces the SEIS sections that discuss the issues for which there is significant new information.

If there is no issue for which there is significant new information, the reviewer should prepare a paragraph for the SEIS similar to the following:

The staff has reviewed the discussion of changes in environmental impacts of decommissioning associated with operation during the renewal term in NUREG-1437 and in the applicant's environmental report and has conducted their own independent review. In this process, the staff did not discover any issue for which there is significant new information.

If there are issues for which there is significant new information, the review should prepare introductory paragraphs for the SEIS similar to the following:

The staff has reviewed the discussion of environmental impacts of decommissioning associated with operation during the renewal term in NUREG-1437 and in the applicant's environmental report and conducted their own independent review. In this process, the staff has determined that there is significant new information related to ____ and _____. Section ____ of this SEIS describes the issue, gives the staff's analysis, and discusses mitigation alternatives for _____. Section _____ covers _____.

Where appropriate, a statement similar to the following should be inserted in the SEIS sections dealing with significant new information:

_____ is a part of the Category 1 issue related to _____. Reconsideration of the conclusions for this issue is limited in scope to the assessment of the relevant new and significant information. The scope does not include review of other facets of the issue that are not affected by the new information.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. 1998. *Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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**7.3 SUMMARY OF EFFECTS OF RENEWAL-TERM OPERATIONS ON
DECOMMISSIONING IMPACTS**

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of a section for the supplemental environmental impact statement (SEIS) that summarizes conclusions related to the changes in the environmental impacts of decommissioning resulting from continued operation during the renewal term.

The scope of the review directed by this plan covers the collection of summary statements prepared by reviewers of supplemental ESRPs (ESRP/S1s) 7.1 and 7.2 and consolidation of the summary statements in an SEIS section that addresses collective as well as individual environmental impacts.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRP/S1s:

- ESRP/S1s 7.1 and 7.2. Obtain summary statements that succinctly give conclusions reached in the staff reviews.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

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Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The reviewer for this ESRP should obtain summary statements from reviewers of ESRP/S1s 7.1 and 7.2.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the evaluation of impacts of the environmental effects of license renewal on decommissioning are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal (LR) and identifies specific areas where additional site-specific analysis is required.

Technical Rationale

The technical rationale for providing a summary of conclusions at the end of the SEIS chapter is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. A summary of conclusions reached is presented at the end of each chapter in NUREG-1437. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1 7.1 and 7.2 and compile a list of conclusions from the SEIS sections that the reviewers have prepared. The conclusions should be checked for completeness and prepared for inclusion in the SEIS. The reviewer should consult with other reviewers for the ESRPs in Chapter 7 to evaluate the collective impact of impacts that are individually of small significance. The reviewer for this ESRP should then prepare a statement about the collective impact of potential changes to environmental impacts of decommissioning resulting from continued operation during the renewal term that are individually of small significance. The conclusions should not contain references.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists the conclusions of the SEIS sections covering potential changes in environmental impacts of decommissioning resulting from continued operation during the renewal term and the conclusion related to the collective impact of impacts that were determined individually to be of small significance. The completed list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission. 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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7.4 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of the section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on changes in the environmental impacts of decommissioning that are related to license renewal.

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 7.1 and 7.2. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language.

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of license renewal and identifies specific areas where additional plant-specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for license renewal is submitted. In NUREG-1437, reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1s 7.1 and 7.2 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering changes in the environmental impacts of decommissioning that are related to license renewal. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for license renewal proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.



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8.0 ALTERNATIVES TO LICENSE RENEWAL

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of introductory paragraphs for the portion of the supplemental environmental impact statement (SEIS) that describes the environmental impacts of alternatives to license renewal (LR) during the renewal term.

The scope of the paragraphs covered by this plan introduces the material from the reviews conducted under supplemental ESRPs (ESRP/S1s) 8.1 through 8.4. It includes descriptions of the alternatives associated with refurbishment and operation during the renewal term discussed in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), and identification of those alternatives that the staff has determined to be inapplicable to the applicant's plant.

Review Interfaces

None.

Data and Information Needs

The reviewer for this ESRP may obtain the following information from the Environmental Project Manager:

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- organizational structure of the SEIS
- list of alternatives considered by the applicant and state authorities
- list of environmental issues associated with refurbishment and operation during the renewal term that have been determined to be inapplicable to the applicant's plant because of plant design and the reason for each determination.

II. ACCEPTANCE CRITERIA

The reviewer should ensure that the introductory paragraphs prepared under this ESRP are consistent with the intent of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of draft EIS at the LR stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the LR stage
- 10 CFR 51, Subpart A, Appendix B, with respect to Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential alternatives to LR is discussed in the following paragraph:

Introductory paragraphs that orient the reader with respect to the relevance of the material to the overall organization and goals of the SEIS add clarity to the presentation. These paragraphs also provide the reader with a clear view of the alternatives considered or rejected and why.

III. REVIEW PROCEDURES

Examine the applicant's ER and consider the range of alternatives adding to or subtracting as appropriate. The range of alternatives to be considered should be focused by the stated purpose and need for the proposed action. The statement of purpose and need adopted by the NRC and stated in NUREG-1437 focuses on meeting future power-system generating needs. Alternatives that meet the stated purpose and need are (1) build new generating capacity, (2) purchase the power from outside the system, and (3) reduce power requirements through demand reduction. The ESRP should demonstrate that the applicant has considered these or similar alternatives. The reviewers should identify the criteria used in evaluating the reasonableness of the alternatives and explain which alternatives will not be considered further and why. The ESRP should identify the alternatives that will be carried forward for comparison with LR. The ESRP should discuss the extent to which these alternatives have been considered by State authorities (e.g., public service commissions and environmental, natural resource, or energy agencies) and how such considerations relate to the applicant's evaluation.

Describe alternatives considered and the justification for including them. This description may draw extensively on NUREG-1437.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare introductory paragraphs for the SEIS. The paragraph(s) should introduce the nature of the material to be presented by the reviewers of information covered by ESRP/S1s 8.1 through 8.3. The paragraph(s) should list the types of information to be presented and describe their relationships to information presented earlier and to be presented later in the SEIS.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. 1999b. *Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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8.1 THE NO-ACTION ALTERNATIVE

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of potential impacts of the no-action alternative. The potential impacts of the no-action alternative have been evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of the no-action alternative in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of the no-action alternative for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 7.3 and 7.4. Obtain a summary of environmental impacts from decommissioning, describing material reviewed, analyses performed, and conclusions reached. Note that the impacts have to do with the timing of decommissioning (earlier vs. delayed 20 years), rather than the fact of decommissioning.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 8.2. Obtain a list of environmental issues for alternative energy sources.
- ESRP/S1 8.3. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP may obtain the following information from the Environmental Project Manager:

- organizational structure of the SEIS
- list of any environmental issues determined to be inapplicable to shutdown and decommissioning of the applicant's plant because of plant design, local circumstances, or characteristics of replacement power and the reason for each determination.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of environmental impacts of the no-action alternative are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of draft EIS at the license renewal (LR) stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the LR stage
- 10 CFR 51, Subpart A, Appendix A, with respect to format for presentation of material in the EIS
- 10 CFR 51, Subpart A, Appendix B, with respect to the Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant specific analyses are required.
- NUREG-0586, "*Final Generic Impact Statement on Decommissioning of Nuclear Facilities*" (NRC 1988), provides the staff with generic conclusions related to the environmental impacts expected from decommissioning.

- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential alternatives to LR is discussed in the following paragraphs:

NUREG-1437 does not contain any conclusions regarding the environmental impact or acceptability of alternatives to LR. Accordingly, the NRC must conduct an analysis of alternatives as part of individual LR reviews. This supplemental ESRP examines the potential environmental impacts associated with denying a renewed license (i.e., the no-action alternative). 10 CFR 51, Subpart A, Appendix A, explicitly requires analysis of the no-action alternative. NUREG-1437 notes that if a renewed license were denied, then the plant generally would be decommissioned sooner than if the license were renewed, and other electric generating sources would be pursued if power were still needed.

The environmental impacts expected from decommissioning are analyzed in NUREG-0586. Consequently, NUREG-0586 represents some of the environmental impacts associated with denial of a renewed license. The no-action alternative does not involve the determination of whether any power is needed or should be generated. The decision to generate power and the determination of how much power is needed are at the discretion of state and utility officials.

Denial of a renewed license may lead to the selection of other electric generating sources to meet energy demands as determined by appropriate state and utility officials, conservation measures, decisions to import power, or a combination of these different outcomes. Therefore, the environmental impacts of such resulting alternatives would be included as the environmental impacts of the no-action alternative. Additionally, a denial of a renewed license would lead to facility decommissioning and its associated impacts; these impacts would also represent impacts of the no-action alternative.

The potential environmental impacts evaluated include land use, ecology, aesthetics, water quality, air quality, solid waste, human health, socioeconomics, and culture.^(a)

(a) As noted in NRC (1998), the staff's discussion of the no-action alternative need not exhaustively treat issues treated elsewhere in the EIS; it may refer to these other discussions. It must be even-handed in its treatment of benefits and costs. Finally, it appropriately may consider and balance socioeconomic benefits both positive and negative.

III. REVIEW PROCEDURES

To analyze the environmental impacts of the no-action alternative, the reviewer should complete the following steps:

- (1) Review the discussion of potential environmental impacts of the no-action alternative and the other alternatives in Chapter 8 of NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Determine if there is new information that should be evaluated. The following sources of information should be included in the search for new information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437. Is the information new in the sense that it post dates the analysis leading to NUREG-1437?
- (3) Determine, from the scope of environmental impacts of the no-action alternative, those that are minor and those that are likely to be sufficiently important to require detailed analysis.

If, based on this analysis, the reviewer determines that there will be more than minor impacts, proceed to Step (4). Otherwise, if the reviewer determines that there will be no environmental impacts or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

- (4) Analyze the environmental impacts associated with the no-action alternative, as follows:
 - Identify and calculate the likely impacts of decommissioning, based on NUREG-0586 and any plant- and site-specific data on the type and scale of the activity involved in earlier decommissioning and the resource requirements involved at the site. Substantial negative socioeconomic impacts are expected on shutdown (temporarily offset to some degree by decommissioning activity), the local ecosystem is expected to improve, and most other resources are expected to be unaffected (land use) or minimally affected (e.g., air quality).
 - Identify and list the likely environmental effects of required alternative-energy sources, based on Chapter 8 of NUREG-1437, the applicant's ER, and the integrated resource plans for the area(s)

or region(s) currently or (if different) likely to be served by the plant. A more complete analysis of alternative energy sources is provided by ESRP/S1 8.2.

- Include in the analysis impacts on land use, water quality, air quality, ecological resources, human health, social and economic structure, waste management, aesthetics, and cultural resources. Direct, indirect, and cumulative impacts should be considered. The level of effort expended on impact analyses of alternatives should be commensurate with the significance of the impacts. Material from NUREG-1437 may be summarized and incorporated by reference to the extent it is applicable.

Data provided in the applicant's ER are adequate if they describe

- the degree to which the local environmental resources would be affected by earlier plant shutdown and decommissioning and by use of replacement energy sources. These data are in agreement with data obtained from other sources, when available.
 - the significance or potential significance of such environmental impacts. NUREG-1437 states that SMALL impacts result when no discernible change in environmental resources occurs as a result of shutdown, decommissioning, and use of alternative energy sources. MODERATE impacts result when there is a discernible change. LARGE impacts occur when there is substantial disruption of environmental resources.
 - any mitigative measures for which credit is being taken to reduce environmental concerns. Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of housing impacts.
- (5) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.
- (6) Based on the results of the assessments listed above, prepare the following for the SEIS:
- a summary statement (qualitative or quantitative, as appropriate) about the degree to which environmental resources are expected to receive impacts from the no-action alternative, together with the significance of these impacts
 - a discussion of the reasoning (e.g., based on locations and changes in population, local government revenue base) behind the estimated degree of impact
 - a discussion of any mitigative measures for which credit could be taken to reduce environmental concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of the no-action alternative. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that local environmental resources will not experience impacts from the no-action alternative.

If the reviewer determines that there will be discernible effects from the no-action alternative, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of measures that would mitigate or avoid the impacts as follows:

The staff has reviewed the available information relative to the no-action alternative. Based on this review, the staff concludes that the impact on most (or, if warranted, the following) environmental resources would be SMALL.

The staff has reviewed the available information relative to the no-action alternative. Based on this review, the staff concludes that the impact would be MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The staff has reviewed the available information relative to the no-action alternative. Based on this review, the staff concludes that the impact would be LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, “Draft environmental impact statement—general.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 51.95, “Postconstruction environmental impact statements.”

10 CFR 51, Subpart A, Appendix A, “Format for Presentation of Material in Environmental Impact Statements.”

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

U.S. Nuclear Regulatory Commission (NRC). 1988. *Final Generic Impact Statement on Decommissioning of Nuclear Facilities*. NUREG-0586, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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8.2 ALTERNATIVE ENERGY SOURCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and assessment of potential impacts of alternative energy sources. The potential impacts of alternative energy sources have been evaluated in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996).

The scope of the review directed by this plan includes (1) review of the discussion of potential impacts of alternative energy sources in NUREG-1437, (2) identification and evaluation of new information related to potential impacts of alternative energy sources for significance, and (3) preparation of input to the supplemental environmental impact statement (SEIS).

Review Interfaces

The reviewer for this ESRP should obtain input from and provide input to the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 7.3 and 7.4. Obtain a summary of environmental impacts from earlier decommissioning, describing material reviewed, analyses performed, and conclusions reached.
- ESRP/S1 8.1. Provide a list of the environmental impacts from alternative energy sources.

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Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. These supplemental environmental standard review plans are keyed to the U.S. NRC Regulatory Guide 4.2, Supplement 1, Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP/S1 8.3. Provide a list of the references cited in the SEIS.

Data and Information Needs

The reviewer for this ESRP may obtain the following information from the Environmental Project Manager:

- organizational structure of the SEIS
- list of environmental impacts associated with alternative energy sources that have been determined to be inapplicable to the applicant's plant and the reason for each determination.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of environmental impacts are based on the relevant requirements of the following regulations:

- 10 CFR 51.53(c) with respect to the content of environmental reports (ERs) and required analyses
- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language
- 10 CFR 51.71 with respect to preparation of draft EIS at the license renewal (LR) stage
- 10 CFR 51.95(c) with respect to preparation of a final EIS at the LR stage
- 10 CFR 51, Subpart A, Appendix B, with respect to the Commission's findings on the scope and magnitude of environmental impacts renewing the operating license for a nuclear power plant.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required.
- Regulatory Guide 4.2, Supplement 1, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses* (NRC 1999), provides guidance on preparation of ERs associated with LR.

Technical Rationale

The technical rationale for evaluating the applicant's description of the potential alternatives to LR is discussed in the following paragraph:

NUREG-1437 does not contain any conclusions regarding the environmental impact or acceptability of alternatives to LR. Accordingly, the NRC must conduct an analysis of alternatives at individual LR reviews. This ESRP examines the potential environmental impacts associated with the alternative energy sources. NUREG-1437 notes that if a renewed license were denied, then the plant generally would be decommissioned earlier than if the license were renewed, and other electric-generating sources would be pursued if power were still needed.

Analysis of alternative energy sources does not involve the determination of whether any power is needed or should be generated. The decision to generate power and the determination of how much power is needed are at the discretion of state and utility officials.

The potential environmental impacts evaluated include land use, ecology, aesthetics, water quality, air quality, solid waste, human health, socioeconomics, and culture.

III. REVIEW PROCEDURES

To analyze the environmental impact of alternative energy sources, the reviewer should complete the following steps:

- (1) Review the discussion of potential environmental impacts of alternative energy sources in Chapter 8 of NUREG-1437 to identify the information considered and the conclusions reached. This step establishes the base for evaluation of information identified by the applicant, the public, and the staff.
- (2) Obtain information for evaluation. The following sources of information should be included in the search for information:
 - the applicant's ER. An applicant is required by 10 CFR 51.53(c)(3)(iv) to disclose new and significant information of environmental impacts of LR of which it is aware. In reviewing the applicant's ER, consider the applicant's process for discovering new information and evaluating the significance of any new information discovered. Is the process adequate to ensure a reasonable likelihood that the applicant would be aware of new information?
 - records of public meetings and correspondence related to the application. Compare information presented by the public with information considered in NUREG-1437.
- (3) Determine, from the scope of environmental impacts of alternative energy sources, those that are minor and those that are likely to be sufficiently important to require detailed analysis.^(a)

(a) NRC (1998) notes that the staff's EIS must be even-handed in its treatment of benefits and costs and appropriately may consider and balance socioeconomic effects, both positive and negative.

If, based on this analysis, the reviewer determines that there will be more than minor impacts, proceed to Step (4). Otherwise, if the reviewer determines that there will be no environmental impacts or that the impacts will be minor, develop a statement to this effect. Examples are shown under Evaluation Findings.

(4) Analyze the environmental impacts associated with alternative energy sources, as follows:

- Identify and calculate the likely environmental impacts of required alternative energy sources including conservation and purchased or imported power, based on Chapter 8 of NUREG-1437, the applicant's ER, and the integrated resource plans for the area(s) or region(s) currently or (if different) likely to be served by the plant. Assume appropriate mitigation measures, for example emission control technologies and best management practices, for each alternative energy source.
- Describe the impacts in sufficient detail so that reviewers may compare the adverse and beneficial impacts of the alternatives with those of renewing the operating license. Impact analyses should consider land use, water quality, air quality, ecological resources, human health, social and economic systems, waste management, aesthetics, and cultural resources. The impacts analyses should include direct, indirect, and cumulative impacts. For each alternative, the analysis should identify and, to the extent possible, quantify, unavoidable adverse impacts, irreversible and irretrievable resource commitments, and tradeoffs between short-term use and long-term productivity of the environment. To the extent possible, each alternative should be analyzed on a site- or region-specific basis. Each impact should be analyzed in proportion to its significance.

Data provided in the applicant's ER are adequate if they describe

- the degree to which the local environmental resources would be affected by use of replacement-energy sources. These data are in agreement with data obtained from other sources, when available.
- the significance or potential significance of such environmental impacts. NUREG-1437 states that SMALL impacts result when no discernable change in environmental resources occurs as a result of using alternative energy sources. MODERATE impacts result when there is a discernable change. LARGE impacts occur when there is substantial disruption of environmental resources.
- any mitigative measures for which credit is being taken to reduce environmental concerns.

Supplemental data obtained from other individuals and organizations may be useful in determining the completeness of the applicant's identification of housing impacts.

(5) Consider and evaluate potential mitigation measures or alternatives that might reduce or eliminate the

adverse impacts or the disproportionate distribution of the impacts in those cases where the impacts are MODERATE or LARGE. These may have been considered in the applicant's ER.

(6) Based on the results of the assessments listed above, prepare the following for the SEIS:

- a summary statement (qualitative or quantitative, as appropriate) about the degree to which environmental resources are expected to receive impacts from alternative energy sources, together with the significance of these impacts
- a discussion of the reasoning (e.g., based on locations and changes in population, local government revenue base, ecological impacts on other nearby plant sites or transmission corridors) behind the estimated degree of impact
- a discussion of any mitigative measures for which credit is being taken to reduce environmental concerns.

IV. EVALUATION FINDINGS

The depth and extent of the information in the SEIS will be governed by the extent and significance of the effects of alternative energy sources. The reviewer should verify that sufficient information is available to meet the relevant requirements and that the evaluation supports statements of the following type to be included in the SEIS, as appropriate.

If the reviewer concludes that there will be no impacts of the alternative energy sources, a statement similar to the following is appropriate:

Based on review of the information provided by the applicant, the staff finds that local environmental resources will not experience impacts from alternative energy sources.

If the reviewer determines that there will be a discernible effect from alternative energy sources, a statement for the SEIS should be prepared that describes the impact(s) and the staff evaluation of alternatives that would mitigate or avoid the impact as follows.

The staff has reviewed the available information relative to alternative energy sources. Based on this review, the staff concludes that the impact on most (or, if warranted, on the following) resources would be SMALL.

The staff has reviewed the available information relative to alternative energy sources. Based on this review, the staff concludes that the impact would be MODERATE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as MODERATE.)

The staff has reviewed the available information relative to alternative energy sources. Based on this review, the staff concludes that the impact would be LARGE.

(The statement should then briefly summarize the reasoning by which impacts have been identified as LARGE.)

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.53, "Postconstruction environmental reports."

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statements."

10 CFR 51, Subpart A, Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. Regulatory Guide 4.2, Supplement 1. *Preparation of Supplemental Environmental Report for Applications to Renew Nuclear Power Plant Operating Licenses*. Washington, D.C.



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8.3 REFERENCES

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of the section of the supplemental environmental impact statement (SEIS) listing references cited in the SEIS chapter on the alternatives to license renewal (LR).

Review Interfaces

The reviewer for this ESRP should obtain input from the reviewers for the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 8.0 through 8.2. Obtain lists of references cited in SEIS sections prepared by the reviewers.

Data and Information Needs

None.

II. ACCEPTANCE CRITERIA

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Acceptance criteria for the preparation of the reference list are based on the relevant requirements of the following regulation:

- 10 CFR 51.70(b) with respect to preparation of a draft environmental impact statement (EIS) that is concise, clear, analytic, and written in plain language

Regulatory positions and specific criteria in support of the regulation identified above are as follows:

- NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional plant-specific analyses are required.

Technical Rationale

The technical rationale for preparing a separate reference list is discussed in the following paragraph:

The NRC staff is required to prepare a plant-specific supplement to NUREG-1437 when an application for LR is submitted. In NUREG-1437, reference lists are presented at the end of each chapter. It is anticipated that supplements to NUREG-1437 will follow the basic format of the original document.

III. REVIEW PROCEDURES

The reviewer should contact reviewers for ESRP/S1s 8.0 through 8.2 and compile a list of references cited in the SEIS sections that the reviewers have prepared. The citations should be checked for completeness and prepared for inclusion in the SEIS.

IV. EVALUATION FINDINGS

The reviewer of information covered by this ESRP should prepare the SEIS section that lists references cited in the SEIS sections covering environmental impacts of refurbishment. The completed reference list constitutes the findings for this ESRP.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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9.0 SUMMARY AND CONCLUSIONS

REVIEW RESPONSIBILITIES

Primary—Appendix A

Secondary—Appendix A

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's preparation of the section of the supplemental environmental impact statement (SEIS) that integrates the conclusions for issues designated Category 1 or resolved Category 2 in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NRC 1996), information developed for those open Category 2 issues applicable to the plant, and significant new information. The section must conclude whether the adverse environmental impacts of license renewal (LR) are so great that preserving the option of LR for energy planning decisionmakers would be unreasonable.

The scope of the review directed by this plan includes (1) review of the summary statements prepared by the reviewers for SEIS Chapters 3 through 7, (2) evaluation of the cumulative impacts of impacts associated with refurbishment, operation during the renewal term, postulated accidents during the renewal term, the uranium fuel cycle and solid-waste management during the renewal term, and changes in environmental impacts of decommissioning resulting from continued operation during the renewal term that were to be of small significance, (3) review of the discussions of the environmental impacts of alternatives prepared by reviewers for Chapter 8, (4) comparison of the adverse environmental impacts of LR for the applicant's plant with the adverse environmental impacts of the alternatives, and (5) preparation of input to the SEIS. The SEIS input should (1) identify adverse environmental impacts that are unavoidable, (2) identify commitments of resources that are irreversible and irretrievable, and (3) discuss the effects of short-term use on maintenance and long-term productivity of the environment.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.



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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

Review Interfaces

The reviewer for this ESRP should obtain, from the Environmental Project Manager, the list of environmental issues from NUREG-1437 that have been determined to be inapplicable to the applicant's plant because of plant design. In addition, the reviewer should obtain the following input from the reviewers of information covered by the following supplemental ESRPs (ESRP/S1s):

- ESRP/S1s 1.1 and 1.2. Obtain the description of the proposed Federal action and the statement of purpose and need for the action.
- ESRP/S1 1.3. Obtain the status of compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.
- ESRP/S1 2.1. Obtain the description of the plant and its setting.
- ESRP/S1s 3.10 and 4.8. Obtain summary statements that succinctly give conclusions reached in the staff reviews of the environmental impacts of refurbishment and operation during the renewal term. The summary statement should (1) identify adverse environmental impacts that are unavoidable, (2) identify commitments of resources that are irreversible and irretrievable, and (3) discuss the effects of short-term use on maintenance and long-term productivity of the environment.
- ESRP/S1s 5.3, 6.3, and 7.3. Obtain summary statements that succinctly give conclusions reached in the staff reviews of the environmental impacts of plant accidents, the uranium fuel cycle and solid-waste management, and decommissioning.
- ESRP/S1s 8.1 and 8.2. Obtain summary statements that succinctly give conclusions reached in the staff reviews of the environmental impacts of the no-action alternative and alternative-energy sources.

Data and Information Needs

The kinds of data and information needed will be affected by site- and station-specific factors; the degree of detail should be scaled according to the anticipated magnitude of the potential impacts. The following data or information may be needed:

- the description of the proposed action and statement of purpose and need for the action
- the status of compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, local, and affected Native American tribal agencies having responsibility for environmental protection
- the description of the plant and its setting

- the discussion of environmental impacts of LR in NUREG-1437
- the discussion of plant-specific environmental impacts of LR in the applicant's environmental report (ER)
- the discussion of environmental impacts of alternatives to LR in NUREG-1437
- the discussion of environmental impacts of alternatives to LR in the applicant's ER
- SEIS statements from reviewers for ESRP/S1s for Chapters 3 through 8.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the preparation of the summary and conclusions are based on the relevant requirements of the following regulations:

- 10 CFR 51.70(a) with respect to preparation of a draft environmental impact statement (EIS)
- 10 CFR 51.70(b) with respect to a concise, clear, analytic EIS written in plain language
- 10 CFR 51.71(d) with respect to including a preliminary analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse environmental effects
- 10 CFR 51.71(d) with respect to including a preliminary recommendation by the NRC staff respecting the proposed action reached after considering the environmental effects of the proposed action and reasonable alternatives
- 10 CFR 51.95(c)(4) with respect to preparation of a final EIS
- 10 CFR 51.95(c)(4) with respect to including the NRC staff recommendation regarding the environmental acceptability of the LR action that integrates the conclusions, as amplified by the supporting information in the generic EIS, for issues designated Category 1 or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information.

Regulatory positions and specific criteria in support of the regulations identified above are as follows:

- NUREG-1437 (NRC 1996) provides the staff's generic conclusions related to the environmental impacts of LR and identifies specific areas where additional site-specific analysis is required.
- NUREG-1555, Chapter 10, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* (NRC 1999), provides additional guidance on the preparation of summary statements related

to unavoidable adverse impacts, irreversible and irretrievable commitment of resources, and the relationship between short-term use and maintenance and long-term productivity of the environment.

- A Council on Environmental Quality (1997) handbook describes methods for evaluating cumulative effects under NEPA.

Technical Rationale

The technical rationale for providing a summary of conclusions at the end of the SEIS chapter is discussed in the following paragraph:

The NRC staff is required to prepare draft and final plant-specific supplements to NUREG-1437 when an application for LR is submitted. The draft SEIS should and the final SEIS must include NRC staff recommendations regarding the environmental acceptability of the proposed action. In making these recommendations, the staff is required to integrate the conclusions, as amplified by the supporting information, in the generic EIS for issues designated Category 1 and or resolved Category 2, information developed for those open Category 2 issues applicable to the plant, and any significant new information. This review plan covers the final integration of information on the environmental impacts of the proposed action, comparison of the environmental impacts of the proposed action with the impact of the alternatives, and preparation of the staff recommendation.

III. REVIEW PROCEDURES

The reviewer for this ESRP is responsible for preparation of the SEIS summary and conclusions section. The summary and conclusions section should be sufficiently complete that a person reading only this section would know the

- proposed Federal action and why the action is being considered
- process leading to preparation of the SEIS
- environmental impacts of LR for the plant
- alternatives to LR for the plant and their potential impacts
- relative significance of the environmental impacts of LR and the alternatives
- staff conclusions and recommendations.

Suggested steps for the review and preparation of the SEIS input are as follows:

- (1) Collect SEIS statements prepared by reviewers for ESRP/S1 Chapters 1 through 8. These chapters should contain all of the information needed for preparation of the Summary and Conclusions chapter except for the final staff recommendation.
- (2) Prepare tables that summarize the findings of the reviews. These tables should include

- a table that lists each of the environmental issues discussed in NUREG-1437 and Appendix B, Subpart A to 10 CFR 51. This table should also include newly emerging issues, if any. The contents of the table should include identification of the issue, the level of significance of the issue relative to the plant, and the SEIS section where the issue is treated.
 - a table that lists the adverse environmental impacts of LR for the plant, states the level of significance of each impact, and lists mitigation measures, if any. Individual and cumulative impacts should be considered in preparing this table.
 - a table that lists the adverse environmental impacts of alternatives to LR for the plant, states the level of significance of each impact, and lists mitigation measures, if any. Individual and cumulative impacts should be considered in preparing this table.
 - a table that compares the adverse environmental impacts of LR with the adverse environmental impacts of the alternatives. The contents of this table should provide the basis for the staff conclusion whether the adverse environmental impacts of LR are so great that preserving the option of LR for energy planning decision makers would be unreasonable. This table should be organized by area of environmental concern, for example, land use, water use, water quality, air quality, aquatic resources, terrestrial resources, radiological impacts, and socioeconomic impacts.
- (3) Convene the project team to consider collective impacts and balance the environmental impacts of the proposed action with those of the alternatives. The project team should also consider the list of unavoidable adverse impacts and the list of irreversible and irretrievable resource commitments, and draw conclusions related to effects of short-term commitments on maintenance and long-term productivity of the environment. The final lists of unavoidable adverse impacts and irreversible and irretrievable resource commitments and a discussion of the effects of short-term use on maintenance and long-term productivity of the environment should be included in the SEIS summary.
- (4) Complete the draft of the SEIS summary and conclusions chapter.

IV. EVALUATION FINDINGS

The reviewer for this ESRP prepares the SEIS section that presents (1) the overall summary of the environmental impacts of LR for the applicant's plant, and (2) the staff recommendations regarding LR. The overall summary should be presented in tabular form to the extent possible. Appropriate tables are described in the Review Procedures section. The staff recommendation should be stated in terms consistent with the wording of 10 CFR 51.95(c)(4). If the staff findings support the LR action, a statement similar to the following should be included in the SEIS summary:

Notice of intent to prepare a site-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NUREG-1437) in connection with the Commission's action on the application of _____ to renew the operating license of _____ was published in the *Federal Register* on _____. The scoping process for the supplemental EIS included

public meetings held in _____ on _____. The staff has reviewed the findings and analysis in NUREG-1437, which are codified in Subpart A of 10 CFR 51, and the applicant's environmental report, which contains an analysis of the plant-specific environmental issues that were not resolved generically in NUREG-1437. The staff has considered major points of view concerning the environmental impacts of the proposed action and the alternatives and significant problems raised by other Federal, State, local, affected Native American tribal agencies and by other interested persons. Based on their independent evaluation of the available information, the staff concludes that the adverse environmental impacts of LR for _____ are not so great that preserving the option of LR for energy planning decision makers would be unreasonable; therefore the LR action is environmentally acceptable.

If the staff findings do not support the LR action, the summary should include a statement similar to the following:

Notice of intent to prepare a site-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (NUREG-1437) in connection with the Commission's action on the application of _____ to renew the operating license of _____ was published in the *Federal Register* on _____. The scoping process for the supplemental EIS included public meetings held in _____ on _____. The staff has reviewed the findings and analysis in NUREG-1437, which are codified in Subpart A of 10 CFR 51, and the applicant's environmental report, which contains an analysis of the plant-specific environmental issues that were not resolved generically in NUREG-1437. That staff has considered major points of view concerning the environmental impacts of the proposed action and the alternatives and significant problems raised by other Federal, State, local, affected Native American tribal agencies and by other interested persons. Based on their independent evaluation of the available information, the staff concludes that the adverse environmental impacts of LR for _____ are so great that preserving the option of LR for energy planning decision makers would be unreasonable; therefore the LR action is environmentally unacceptable.

V. IMPLEMENTATION

The method described in this ESRP will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant for LR proposes an acceptable alternative for complying with specified portions of the regulations.

VI. REFERENCES

10 CFR 51.70, "Draft environmental impact statement—general."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.95, "Postconstruction environmental impact statement."

10 CFR 51, Subpart A, Appendix B, “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

Council on Environmental Quality (CEQ). 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*, Executive Office of the President, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Washington, D.C.

Appendix A

Environmental Standard Review Plan Review Responsibilities

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Environmental Standard Review Plan Review Responsibilities

This appendix lists the organization within the U.S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation having review responsibility for each Environmental Standard Review Plan. The review responsibility list is current as of October 1999.

| Plan | Primary Responsibility | Secondary Responsibility |
|-------------|---|---------------------------------|
| 1.0 | Generic Issues, Environmental, Financial and Rulemaking Branch (RGEB) | None |
| 1.1 | RGEB | None |
| 1.2 | RGEB | None |
| 1.3 | RGEB | None |
| 1.4 | RGEB | None |
| 2.0 | RGEB | None |
| 2.1 | RGEB | None |
| 2.1.1 | RGEB | None |
| 2.1.2 | RGEB | None |
| 2.1.3 | RGEB | None |
| 2.1.4 | RGEB | None |
| 2.1.5 | RGEB | None |
| 2.1.6 | RGEB | None |
| 2.1.7 | RGEB | None |
| 2.2 | RGEB | None |
| 2.2.1 | RGEB | None |
| 2.2.2 | RGEB | None |
| 2.2.3 | RGEB | None |
| 2.2.4 | RGEB | None |
| 2.2.5 | RGEB | None |
| 2.2.6 | RGEB | None |
| 2.2.7 | RGEB | None |
| 2.2.8 | RGEB | None |

| Plan | Primary Responsibility | Secondary Responsibility |
|-------------|---|---------------------------------|
| 2.2.9 | RGEB | None |
| 2.3 | RGEB | None |
| 3.0 | RGEB | None |
| 3.1 | RGEB | None |
| 3.2 | RGEB | None |
| 3.2.1 | RGEB | None |
| 3.3 | RGEB | None |
| 3.4 | RGEB | None |
| 3.5 | RGEB | None |
| 3.5.1 | RGEB | None |
| 3.6 | RGEB | None |
| 3.6.1 | RGEB | None |
| 3.6.2 | RGEB | None |
| 3.6.3 | RGEB | None |
| 3.6.4 | RGEB | None |
| 3.6.5 | RGEB | None |
| 3.6.6 | RGEB | None |
| 3.6.7 | RGEB | None |
| 3.7 | Operator Licensing, Human Performance and Plant Support Branch (IOLB) | RGEB |
| 3.8 | RGEB | None |
| 3.8.1 | RGEB | None |
| 3.9 | RGEB | None |
| 3.10 | RGEB | None |
| 3.11 | RGEB | None |
| 4.0 | RGEB | None |
| 4.1 | RGEB | None |
| 4.1.1 | RGEB | None |
| 4.1.2 | RGEB | None |
| 4.1.3 | RGEB | None |
| 4.14 | RGEB | None |
| 4.15 | RGEB | None |
| 4.2 | RGEB | None |
| 4.2.1 | RGEB | None |
| 4.2.2 | RGEB | None |

| Plan | Primary Responsibility | Secondary Responsibility |
|-------------|---|---------------------------------|
| 4.3 | IOLB | RGEB |
| 4.4 | RGEB | None |
| 4.4.1 | RGEB | None |
| 4.4.2 | RGEB | None |
| 4.4.3 | RGEB | None |
| 4.4.4 | RGEB | None |
| 4.4.5 | RGEB | None |
| 4.4.6 | RGEB | None |
| 4.5 | RGEB | None |
| 4.5.1 | RGEB | None |
| 4.5.2 | RGEB | None |
| 4.5.3 | RGEB | None |
| 4.5.4 | RGEB | None |
| 4.6 | RGEB | None |
| 4.6.1 | RGEB | None |
| 4.7 | RGEB | None |
| 4.8 | RGEB | None |
| 4.9 | RGEB | None |
| 5.0 | RGEB | None |
| 5.1 | Probabilistic Safety Assessment Branch (SPSB) | RGEB |
| 5.1.1 | SPSB | RGEB |
| 5.2 | RGEB | None |
| 5.3 | RGEB | None |
| 5.4 | RGEB | None |
| 6.0 | RGEB | None |
| 6.1 | RGEB | None |
| 6.2 | RGEB | None |
| 6.3 | RGEB | None |
| 6.4 | RGEB | None |
| 7.0 | RGEB | None |
| 7.1 | RGEB | None |
| 7.2 | RGEB | None |
| 7.3 | RGEB | None |
| 7.4 | RGEB | None |
| 8.0 | RGEB | None |

| Plan | Primary Responsibility | Secondary Responsibility |
|-------------|-------------------------------|---------------------------------|
| 8.1 | RGEB | None |
| 8.2 | RGEB | None |
| 8.3 | RGEB | None |
| 9.0 | RGEB | None |