

1.0 Introduction

Under the Nuclear Regulatory Commission's (NRC's) environmental-protection regulations in Title 10 of the Code of Federal Regulations (CFR) Part 51, which implement the National Environmental Policy Act of 1969 (NEPA), renewal of a nuclear power plant operating license (OL) requires the preparation of an environmental impact statement (EIS). In preparing the EIS, the NRC staff is required first to issue the statement in draft form for public comment and then issue a final statement after considering public comments on the draft. To support the preparation of the EIS, the staff has prepared a *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996; 1999).^(a) The GEIS is intended to (1) provide an understanding of the types and severity of environmental impacts that may occur as a result of license renewal of nuclear power plants under 10 CFR Part 54, (2) identify and assess the impacts that are expected to be generic to license renewal, and (3) support 10 CFR Part 51 to define the number and scope of issues that need to be addressed by the applicants in plant-by-plant renewal proceedings. The GEIS guides the preparation of complete plant-specific information in support of the OL renewal process.

The Omaha Public Power District (OPPD) operates the Fort Calhoun Station, Unit 1 in Nebraska under OL DPR-40, which was issued by the NRC. This OL will expire in August 2013. On January 9, 2002, the OPPD submitted an application to the NRC to renew the Fort Calhoun Station, Unit 1 OL for an additional 20 years under 10 CFR Part 54. On January 18, 2002, the OPPD submitted a revised application that corrected minor administrative errors in Appendix E of the application. The OPPD is a *licensee* for the purposes of its current OL and an *applicant* for the renewal of the OL. Pursuant to 10 CFR 54.23 and 51.53(c), the OPPD submitted an Environmental Report (ER; OPPD 2002) as Appendix E to the OL renewal application in which the OPPD analyzed the environmental impacts associated with the proposed license renewal action, considered alternatives to the proposed action, and evaluated mitigation measures for reducing adverse environmental effects.

This report is the plant-specific supplement to the GEIS (the supplemental EIS [SEIS]) for the OPPD license renewal application. This SEIS is a supplement to the GEIS because it relies, in part, on the findings of the GEIS. The staff will also prepare a separate safety evaluation report in accordance with 10 CFR Part 54.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

1.1 Report Contents

The following sections of this introduction (1) describe the background for the preparation of this SEIS, including the development of the GEIS and the process used by the staff to assess the environmental impacts associated with license renewal; (2) describe the proposed Federal action to renew the Fort Calhoun Station, Unit 1 OL; (3) discuss the purpose and need for the proposed action; and (4) present the status of the OPPD's compliance with environmental quality standards and requirements that have been imposed by Federal, State, regional, and local agencies that are responsible for environmental protection.

The ensuing chapters of this SEIS closely parallel the contents and organization of the GEIS. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. Chapters 3 and 4, respectively, discuss the potential environmental impacts of plant refurbishment and plant operation during the renewal term. Chapter 5 contains an evaluation of potential environmental impacts of plant accidents and includes a consideration of severe accident mitigation alternatives. Chapter 6 discusses the uranium fuel cycle and solid-waste management. Chapter 7 discusses decommissioning, and Chapter 8 discusses alternatives to license renewal. Finally, Chapter 9 summarizes the findings of the preceding chapters and draws conclusions about the adverse impacts that cannot be avoided (the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and the irreversible or irretrievable commitment of resources). The final chapter also presents the staff's recommendation with respect to the proposed license renewal action.

Additional information is included in appendices. Appendix A contains public comments received on the environmental review for license renewal and staff responses. Appendices B through F, respectively, list the following:

- the contributors to the supplement
- the chronology of the NRC staff's environmental review correspondence related to this SEIS
- the organizations contacted during the development of this SEIS
- the OPPD's compliance status
- GEIS environmental issues that are not applicable to Fort Calhoun Station, Unit 1.

1.2 Background

Use of the GEIS, which examines the possible environmental impacts that could occur as a result of renewing individual nuclear-power-plant OLS under 10 CFR Part 54, and the established license renewal evaluation process supports the thorough evaluation of the impacts of the renewal of OLS.

1.2.1 Generic Environmental Impact Statement

The NRC initiated a generic assessment of the environmental impacts associated with the license renewal term to improve the efficiency of the license renewal process by documenting the assessment results and codifying the results in the Commission's regulations. This assessment is provided in the GEIS, which serves as the principal reference for all nuclear power plant license renewal EISs.

The GEIS documents the results of the systematic approach that was taken to evaluate the environmental consequences of renewing the licenses of individual nuclear power plants and operating them for an additional 20 years. For each potential environmental issue, the GEIS (1) describes the activity that affects the environment, (2) identifies the population or resource that is affected, (3) assesses the nature and magnitude of the impact on the affected population or resource, (4) characterizes the significance of the effect for both beneficial and adverse effects, (5) determines whether the results of the analysis apply to all plants, and (6) considers whether additional mitigation measures would be warranted for impacts that would have the same significance level for all plants.

The NRC's standard of significance was established using the Council on Environmental Quality (CEQ) terminology for "significantly" (40 CFR 1508.27, which requires consideration of both "context" and "intensity"). Using the CEQ terminology, the NRC established three significance levels—SMALL, MODERATE, or LARGE. The definitions of the three significance levels are set forth in the footnotes to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, as follows:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

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The GEIS assigns a significance level to each environmental issue, assuming that ongoing mitigation measures would continue.

The GEIS includes a determination of whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues are then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS,

Category 1 issues are those that meet all of the following criteria:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic.
- (2) 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).
- (3) 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 to not be sufficiently beneficial to warrant implementation.

For issues that meet the three Category 1 criteria, no additional plant-specific analysis is required in this SEIS unless new and significant information is identified.

Category 2 issues are those that do not meet one or more of the criteria of Category 1, and therefore, additional plant-specific review for these issues is required.

In the GEIS, the staff assessed 92 environmental issues and determined that 69 qualified as Category 1 issues, 21 qualified as Category 2 issues, and 2 issues were not categorized. The latter 2 issues, environmental justice and chronic effects of electromagnetic fields, are to be addressed in a plant-specific analysis. Of the 92 issues, 11 are related only to refurbishment, 6 are related only to decommissioning, 67 apply only to operation during the renewal term, and 8 apply to both refurbishment and operation during the renewal term. A summary of the findings for all 92 issues in the GEIS is codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

1.2.2 License Renewal Evaluation Process

An applicant seeking to renew its OL is required to submit an ER as part of its application. The license renewal evaluation process involves a careful review of the applicant's ER and assurance that all new and potentially significant information not already addressed in or

available during the GEIS evaluation is identified, reviewed, and assessed to verify the environmental impacts of the proposed license renewal.

In accordance with 10 CFR 51.53(c)(2) and (3), the ER submitted by the applicant must

- provide an analysis of the Category 2 issues in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B in accordance with 10 CFR 51.53(c)(3)(ii)
- discuss actions to mitigate any adverse impacts associated with the proposed action and environmental impacts of alternatives to the proposed action.

In accordance with 10 CFR 51.53(c)(2), the ER does not need to

- consider the economic benefits and costs of the proposed action and alternatives to the proposed action except insofar as such benefits and costs are either (1) essential for making a determination regarding the inclusion of an alternative in the range of alternatives considered or (2) relevant to mitigation
- consider the need for power and other issues not related to the environmental effects of the proposed action and the alternatives
- discuss any aspect of the storage of spent fuel within the scope of the generic determination in 10 CFR 51.23(a) in accordance with 10 CFR 51.23(b)
- contain an analysis of any Category 1 issue unless there is significant new information on a specific issue—this is pursuant to 10 CFR 51.23(c)(3)(iii) and (iv).

New and significant information is (1) information that identifies a significant environmental issue not covered in the GEIS and codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, or (2) information that was not considered in the analyses summarized in the GEIS and that leads to an impact finding that is different from the finding presented in the GEIS and codified in 10 CFR Part 51.

In preparing to submit its application to renew the Fort Calhoun Station, Unit 1 OL, the OPPD developed a process to ensure that information not addressed in or available during the GEIS evaluation regarding the environmental impacts of license renewal for Fort Calhoun Station, Unit 1 would be properly reviewed before submitting the ER and to ensure that such new and potentially significant information related to the renewal of the license for Unit 1 would be identified, reviewed, and assessed during the period of the NRC review. The OPPD reviewed the Category 1 issues that appear in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, to verify that the conclusions of the GEIS remained valid with respect to Fort Calhoun Station,

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Unit 1. This review was performed by personnel from the OPPD and its support organization who were familiar with NEPA issues and the scientific disciplines involved in the preparation of a license renewal ER.

The NRC staff also has a process for identifying new and significant information. That process is described in detail in *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*, NUREG-1555, Supplement 1 (NRC 2000). The search for new information includes (1) review of an applicant's ER and the process for discovering and evaluating the significance of new information; (2) review of records of public comments; (3) review of environmental quality standards and regulations; (4) coordination with Federal, State, and local environmental protection and resource agencies; and (5) review of the technical literature. New information discovered by the staff is evaluated for significance using the criteria set forth in the GEIS. For Category 1 issues where new and significant information is identified, reconsideration of the conclusions for those issues is limited in scope to the assessment of the relevant new and significant information; the scope of the assessment does not include other facets of the issue that are not affected by the new information.

Chapters 3 through 7 discuss the environmental issues considered in the GEIS that are applicable to Fort Calhoun Station, Unit 1. At the beginning of the discussion of each set of issues, there is a table that identifies the issues to be addressed and lists the sections in the GEIS where the issue is discussed. Category 1 and Category 2 issues are listed in separate tables. For Category 1 issues for which there is no new and significant information, the table is followed by a set of short paragraphs that state the GEIS conclusion codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, followed by the staff's analysis and conclusion. For Category 2 issues, in addition to the list of GEIS sections where the issue is discussed, the tables list the subparagraph of 10 CFR 51.53(c)(3)(ii) that describes the analysis required and the SEIS sections where the analysis is presented. The SEIS sections that discuss the Category 2 issues are presented immediately following the table.

The NRC prepares an independent analysis of the environmental impacts of license renewal and compares these impacts with the environmental impacts of alternatives. The OPPD license renewal application was reviewed by the staff for completeness and acceptability for docketing, and a notice was published in the *Federal Register* (FR; 67 FR 6551 [NRC 2002d]). This FR notice, which also outlined the opportunity for a hearing, was amended on April 22, 2002, to correct an error in the title and date (67 FR 19599 [NRC 2002c]). The staff published a notice of intent to prepare an EIS and conduct scoping (67 FR 31847 [NRC 2002a]) on May 10, 2002. Two public scoping meetings were held on June 18, 2002, in Omaha, Nebraska. Comments received during the scoping period were summarized in the *Fort Calhoun Station License Renewal Environmental Scoping Report* (NRC 2002b) dated November 22, 2002. Comments that are applicable to this environmental review are presented in Part I of Appendix A.

The staff followed the review guidance contained in the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*, NUREG-1555, Supplement 1 (NRC 2000). The staff and its contractors visited Fort Calhoun Station on June 18, 19, and 20, 2002, to gather information and to become familiar with the site and its environs. The staff also reviewed the comments received during scoping and consulted with Federal, State, regional, and local agencies. A list of the organizations consulted is provided in Appendix D. Other documents related to Fort Calhoun Station, Unit 1 were reviewed and are referenced in this report.

On January 14, 2003, the Notice of Availability of the draft SEIS and notice of public meetings to discuss the draft SEIS was published in the Federal Register (68FR1873 [NRC 2003]). A 75-day comment period began on that date, during which members of the public could comment on the preliminary results of the staff's review. The staff held two public meetings in Omaha, Nebraska, on February 26, 2003, to describe the preliminary results of the NRC environmental review, answer questions, and provide members of the public with information to assist them in formulating comments on the draft SEIS. All of the comments on the draft SEIS received during the comment period were considered in developing the final SEIS and are presented along with responses in Appendix A, Part II.

This SEIS presents the staff's analysis that considers and weighs the environmental effects of the proposed renewal of the OL for Fort Calhoun Station, Unit 1, the environmental impacts of alternatives to license renewal, and the mitigation measures available for avoiding adverse environmental effects. Chapter 9, "Summary and Conclusions," provides the NRC staff's recommendation to the Commission on whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable.

1.3 The Proposed Federal Action

The proposed Federal action is renewal of the OL for Fort Calhoun Station, Unit 1. The Fort Calhoun Station site is located in Washington County, Nebraska, on the southwestern bank of the Missouri River, approximately 31 km (19 mi) north-northwest of downtown Omaha, Nebraska.

The current OL for Unit 1 expires on August 9, 2013. By letter dated January 9, 2002 (Gates 2002a), as amended by letter dated January 18, 2002 (Gates 2002b), the OPPD submitted an application to the NRC to renew the OL for an additional 20 years of operation, until August 9, 2033. If the OL is renewed, the schedule is to issue the renewed license in November 2003. The renewed license would supersede the current license. If the OL is not renewed, then the plant must be shut down at or before the expiration date of the current OL, which is August 9, 2013.

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Fort Calhoun Station, Unit 1 is a pressurized-water-reactor plant designed by Combustion Engineering, with a net generating capability of 476 megawatts electric (MW[e]). Plant cooling is provided by a once-through heat dissipation system that dissipates heat to the environment. Fort Calhoun Station, Unit 1 produces electricity to supply the needs of approximately 320,000 households in the OPPD's service territory.

1.4 The Purpose and Need for the Proposed Action

Although a licensee must have a renewed license to operate a reactor beyond the term of the existing OL, the possession of that license is just one of a number of conditions that must be met for the licensee to continue plant operation during the term of the renewed license. Once an OL is renewed, State regulatory agencies and the owners of the plant will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners.

Thus, for license renewal reviews, the NRC has adopted the following definition of purpose and need (GEIS Section 1.3):

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 generating needs, as such needs may be determined by State, utility, and where authorized, Federal (other than NRC) decisionmakers.

This definition of purpose and need reflects the Commission's recognition that, unless there are findings in the safety review required by the Atomic Energy Act of 1954 or findings in the NEPA environmental analysis that would lead the NRC to reject a license renewal application, the NRC does not have a role in the energy-planning decisions of State regulators and power plant licensees as to whether a particular nuclear power plant should continue to operate. From the perspective of the licensee and the State regulatory authority, the purpose of renewing an OL is to maintain the availability of the nuclear plant to meet system energy requirements beyond the current term of the plant's license.

1.5 Compliance and Consultations

The OPPD is required to hold certain Federal, State, and local environmental permits, as well as meet relevant Federal and State statutory requirements. In its ER, the OPPD provided a list of the authorizations from Federal, State, and local authorities for current operations, as well as environmental approvals and consultations associated with the Fort Calhoun Station, Unit 1 OL renewal. The list of authorizations and consultations provided by the OPPD is included in

Appendix E. The staff reviewed the list and consulted with the appropriate Federal, State, and local agencies to identify any compliance or permit issues or significant environmental issues of concern to the reviewing agencies. No agency, with the exception of the U.S. Fish and Wildlife Service (FWS), identified any issues.

The staff consulted with FWS in accordance with Section 7 of the Endangered Species Act (ESA). Although the staff has come to the conclusion that the proposed renewal of the Fort Calhoun Station, Unit 1, operating license is not likely to adversely affect any threatened or endangered species, the FWS has been unable to concur with the staff's determination. As a result, pursuant to 50 CFR § 402.14(a), the staff plans to pursue formal consultation with FWS. Since the current operating license (the impacts of which were analyzed in *Final Environmental Statement Related to the Operation of Fort Calhoun Station Unit 1* [AEC 1972]) does not expire until August 2013, the staff has determined that the proposed action causes no irreversible or irretrievable commitment of resources not previously considered, and that proceeding with the proposal does not foreclose the formulation or implementation of any reasonable and prudent alternatives. Therefore, pursuant to 50 CFR § 402.09, the staff has concluded that the proposed action may proceed.

The OPPD's ER states that the OPPD is in compliance with applicable environmental standards and requirements for Fort Calhoun Station, Unit 1. The staff has not identified any environmental issues that are both new and significant.

1.6 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

40 CFR Part 1508. Code of Federal Regulations, Title 40, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, Part 1508, "Terminology and Index."

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Omaha Public Power District (OPPD). 2002. *Applicant's Environmental Report – Operating License Renewal Stage Fort Calhoun Station Unit 1*. Omaha, Nebraska.

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

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U.S. Nuclear Regulatory Commission (NRC). 2002a. "Omaha Public Power District, Fort Calhoun Station Unit 1; Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process." *Federal Register*, Vol. 67, No. 91, pp. 31847–31848. May 10, 2002.

U.S. Nuclear Regulatory Commission (NRC). 2002b. *Issuance of Environmental Scoping Summary Report Associated with the Staff's Review of the Application for Renewal of the Operating License for Fort Calhoun Station Unit 1*. November 22, 2002.

U.S. Nuclear Regulatory Commission (NRC). 2002c. "Omaha Public Power District (OPPD), Fort Calhoun Station Unit 1; Notice of Acceptance for Docketing of the Application and Notice of Opportunity for a Hearing Regarding Renewal of License No. DPR-40 for an Additional Twenty-Year Period: Correction." *Federal Register*, Vol. 67, No. 77, pp. 19599–19600. April 22, 2002.

U.S. Nuclear Regulatory Commission (NRC). 2002d. "Omaha Public Power District (OPPD) Fort Calhoun Station Unit 1 Notice of Receipt of Application for Renewal of Facility Operating License No. DPR-40 for an Additional 20-Year Period." *Federal Register*, Vol. 67, No. 29, p. 6551. February 12, 2002.

U.S. Nuclear Regulatory Commission (NRC). 2003. "Omaha Public Power District, Fort Calhoun Station, Unit 1; Notice of Availability of the Draft Supplement 12 to the Generic Environmental Impact Statement and Public Meeting for the License Renewal of Fort Calhoun Station, Unit 1." *Federal Register*, Vol. 68, No. 91, pp. 1873–1874. January 14, 2003.