[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 51

[NRC-2020-0101]

RIN 3150-AK55

Advanced Nuclear Reactor Generic Environmental Impact Statement

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule, draft guidance, and draft generic environmental impact statement; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend the regulations that govern the NRC's environmental reviews of advanced nuclear reactor applications under the National Environmental Policy Act. The rulemaking would codify the generic findings of the NRC's draft Advanced Nuclear Reactor Generic Environmental Impact Statement. The draft Advanced Nuclear Reactor Generic Environmental Impact Statement uses a technology-neutral framework and a set of plant and site parameters to determine which potential environmental impacts would be common to the construction, operation, and decommissioning of most advanced nuclear reactors, and thus appropriate for a generic analysis, and which potential environmental impacts would be unique, and thus require a project-specific analysis. The NRC expects that both the proposed rule and the Advanced Nuclear Reactor Generic Environmental Impact Statement would streamline the environmental reviews for future advanced nuclear reactor applicants.

The NRC is also issuing for public comment draft regulatory guide (DG), DG-4032, "Preparation of Environmental Reports for Nuclear Power Stations," and COL-ISG-030, "Environmental Considerations Associated with Advanced Nuclear Reactor Applications that Reference the Generic Environmental Impact Statement (NUREG-2249)."

DATES: Submit comments by **[INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received before this date. The NRC will hold a public meeting at NRC headquarters in Rockville, MD during the comment period for this proposed rule. This meeting will include a webinar for those attending virtually. The public meeting and webinar will be conducted on MONTH DAY, 2022 from 1:00 - 4:00 p.m.

ADDRESSES: You may submit comments by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- **Federal rulemaking website:** Go to https://www.regulations.gov and search for Docket ID NRC-2020-0101. Address questions about NRC dockets to Dawn Forder; telephone: 301-415-3407; email: Dawn.Forder@nrc.gov. For technical questions contact the individuals listed in the FOR FURTHER INFORMATION CONTACT section of this document.
- **Email comments to:** Rulemaking.Comments@nrc.gov. If you do not receive an automatic email reply confirming receipt, then contact us at 301-415-1677.
- **Mail comments to**: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

For additional direction on obtaining information and submitting comments, see "Obtaining Information and Submitting Comments" in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Stewart Schneider, Office of Nuclear Material Safety and Safeguards, telephone: 301-415-4123, email: Stewart.Schneider@nrc.gov, or Laura Willingham, Office of Nuclear Material Safety and Safeguards, telephone: 301-415-0857, email: Laura.Willingham@nrc.gov. Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

SUPPLEMENTARY INFORMATION:

Executive Summary

A. Purpose of the Regulatory Action

The U.S. Nuclear Regulatory Commission (NRC) is proposing to revise its regulations to codify the findings of the draft generic environmental impact statement, NUREG-2249, "Generic Environmental Impact Statement for Advanced Nuclear Reactors" (ANR GEIS). The draft ANR GEIS analyzes the potential environmental impacts of the construction, operation, and decommissioning of an advanced nuclear reactor. The ANR GEIS is intended to improve the efficiency of the NRC staff's environmental review of an advanced nuclear reactor application by identifying those potential environmental issues that are expected to be common, or generic, to the construction, operation, and decommissioning of most advanced nuclear reactors. If the Commission approves issuance of the ANR GEIS, the NRC staff would be able to rely on the ANR GEIS' generic findings when conducting a subsequent, site-specific environmental review for an advanced nuclear reactor if specific conditions are met. The

proposed rule would codify these generic findings into the NRC's regulations in part 51 of title 10 of the *Code of Federal Regulations* (10 CFR), "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," thus making the NRC's licensing process for advanced nuclear reactors more efficient. Specifically, these findings would be codified into subpart A of 10 CFR part 51, which sets forth the NRC's regulations to implement its obligations under the National Environmental Policy Act (NEPA).[1]

B. Major Provisions

Major provisions of this proposed rule and guidance would include:

1. Addition of a new appendix C to subpart A of 10 CFR part 51 to codify the Commission's generic findings in the ANR GEIS.

2. Changes to the regulations for the preparation of environmental reports for new reactors (§ 51.50) to provide the applicant with the option to use the ANR GEIS.

3. Changes to the regulations for the preparation of draft environmental impact statements (EISs) for new reactors (§ 51.75) to require the NRC staff to use the ANR GEIS in preparing its draft EIS if an applicant for an advanced nuclear reactor referenced the ANR GEIS in its application.

4. Addition of new section (§ 51.96) to provide the NRC staff with directions on the preparation of final EISs that reference the ANR GEIS.

5. Draft revisions to Regulatory Guide (RG) 4.2, "Preparation of Environmental Reports for Nuclear Power Stations," [2] to provide guidance to applicants regarding the use of the ANR GEIS. In addition, the NRC staff has prepared a draft interim staff

[1] 42 U.S.C. §§ 4321 *et seq.* (1969).

[2] Unless stated otherwise, references to RG 4.2 refer to DG-4032, the draft revision to RG 4.2, which is being published at the same time as this notice.

guidance document, COL-ISG-030, “Environmental Considerations Associated with Advanced Nuclear Reactor Applications that Reference the Generic Environmental Impact Statement (NUREG-2249)” to provide guidance to the NRC staff regarding the use of the ANR GEIS.

C. Costs and Benefits

The NRC prepared a draft regulatory analysis to determine the expected quantitative costs and benefits of this proposed rule and associated guidance. Assuming eight applications over the next decade, the regulatory analysis concluded that the proposed rule alternative and associated guidance would result in undiscounted total net savings for the NRC and applicants up to $14.5 million or $2.0 million per application if the ANR GEIS is fully utilized.

The draft regulatory analysis also considered qualitative factors to be considered in the NRC’s rulemaking decision. Qualitative aspects include greater regulatory stability, predictability, and clarity to the licensing process. The proposed rule would reduce the cost to industry of preparing environmental reports for advanced nuclear reactor applications by focusing resources on project-specific analyses. The NRC also would recognize similar reductions in cost and be better able to focus its resources on the important project-specific issues during advanced nuclear reactor licensing environmental reviews.

Because the ANR GEIS could potentially be utilized for advanced micro-reactors, the NRC staff does not have sufficient information at this time to determine whether the proposed rule could potentially affect any small entities as defined in § 2.810. Therefore, the NRC staff has included an initial regulatory flexibility analysis in Section VI of this document and is requesting public comment on the potential impact of the proposed rule on small entities.

For more information, please see the draft regulatory analysis (available as indicated in Section XVI, Availability of Documents, of this document).

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I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID NRC-2020-0101 when contacting the NRC about the availability of information for this action. You may obtain publicly available information related to this action by any of the following methods:

- **Federal Rulemaking Website:** Go to https://www.regulations.gov and search for Docket ID NRC-2020-0101.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly available documents online in the ADAMS Public Documents collection at https://www.nrc.gov/reading-rm/adams.html. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please

contact the NRC's Public Document Room reference staff at 1-800-397-4209, at 301-415-4737, or by email to PDR.Resource@nrc.gov. For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in the Availability of Documents section.

- **NRC's PDR:** You may examine and purchase copies of public documents, by appointment, at the NRC's Public Document Room (PDR), Room P1 B35, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8:00 a.m. and 4:00 p.m. (ET), Monday through Friday, except Federal holidays.

- **Technical Library:** The Technical Library, which is located at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland 20852, is open by appointment only. Interested parties may make appointments to examine documents by contacting the NRC Technical Library by email at Library.Resource@nrc.gov between 8:00 a.m. and 4:00 p.m. (EST), Monday through Friday, except Federal holidays.

B. Submitting Comments

The NRC encourages electronic comment submission through the Federal rulemaking website (https://www.regulations.gov). Please include Docket ID NRC-2020-0101 in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at https://www.regulations.gov as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Background

The ANR GEIS is intended to streamline the NRC's environmental review for advanced nuclear reactor applications received as part of the reactor licensing process[3] This Background section provides an overview of the two existing reactor licensing processes, 10 CFR part 50 and 10 CFR part 52, under which an applicant may apply for a license for an advanced nuclear reactor. This section also describes the environmental review process and the Commission's policy and past practice with respect to the use of generic rulemakings to adopt improvements to the licensing process.

A. New Reactor Licensing Processes—10 CFR Part 50 and 10 CFR Part 52

The NRC licenses and regulates the construction and operation of nuclear reactor facilities in the United States. The NRC's evaluation and ultimate decision on a reactor application will involve a safety review, governed by the NRC's regulations in either 10 CFR part 50 or 10 CFR part 52, and an environmental review, governed by the

[3] In staff requirements memorandum, SRM-SECY-20-0020, "Results of Exploratory Process for Developing a Generic Environmental Impact Statement for the Construction and Operation of Advanced Nuclear Reactors," dated September 21, 2020, the Commission approved the development of a GEIS for the construction and operation of advanced nuclear reactors and directed staff to codify the generic findings in the *Code of Federal Regulations*.

NRC's regulations in 10 CFR part 51. All nuclear reactors that were operating prior to 2021 were licensed under a two-step licensing process governed by 10 CFR part 50. The first step is an application for and issuance of a construction permit. The second step, upon substantial completion of facility construction, is issuance of an operating license.

In an effort to improve regulatory efficiency and add greater predictability to the reactor licensing process, the NRC issued 10 CFR part 52 on April 18, 1989 (54 FR 15372). The rule added licensing processes for issuance of early site permits, standard design certifications, and combined licenses. Early site permits allow an applicant to obtain approval for a reactor site for future use, while certified standard plant designs can be used as pre-approved designs. Early site permits and certified designs can then be referenced in an application for a combined license. Combined licenses combine a construction permit and an operating license in a single authorization.

An advanced nuclear reactor applicant could apply for a license under 10 CFR part 50 or 10 CFR part 52. The proposed rule to adopt the generic environmental conclusions of the ANR GEIS in 10 CFR part 51 would be available for use in conjunction with either of these two licensing processes. Additionally, the NRC staff is preparing a rulemaking that would provide a new reactor licensing framework in a proposed 10 CFR part 53.[4] The NRC staff anticipates that the ANR GEIS would be available for use with this new 10 CFR part 53 licensing process.

B. Environmental Review—Current 10 CFR Part 51 Regulations

As a Federal agency, the NRC must comply with NEPA by assessing the potential environmental effects of a proposed agency action prior to making a decision to

[4] Risk-Informed, Technology Inclusive Regulatory Framework for Advanced Reactors (Docket ID NRC-2019-0062; RIN 3150-AK31).

approve or disapprove of that proposed action. The regulations implementing the NRC's NEPA review are found in 10 CFR part 51.

Under NEPA, the environmental review of a proposed action can involve one of three different levels of analysis depending on the significance of a proposed action's potential effects on the environment: 1) a categorical exclusion,[5] 2) an environmental assessment,[6] or 3) an environmental impact statement (EIS). An EIS, the most complex, resource-intensive, and thorough of the three levels of NEPA analysis, is a document that describes the potential environmental impacts of the proposed action as well as reasonable alternatives to the proposed action. The NEPA requires that Federal agencies prepare an EIS for any proposed agency action that may result in a significant impact to an environmental resource. In addition, the Commission has identified, by its § 51.20 regulation, certain categories of NRC proposed actions that require the preparation of an EIS. In this regard, § 51.20(b)(1) identifies the issuance of a construction permit (under the 10 CFR part 50 licensing process) or an early site permit (under the 10 CFR part 52 licensing process) for a nuclear power reactor or testing facility, as proposed actions requiring the preparation of an EIS.[7] Similarly, § 51.20(b)(2) identifies the issuance or renewal of an operating license (under 10 CFR part 50) or a combined license (under 10 CFR part 52) for a nuclear power reactor or testing facility, as proposed actions requiring the preparation of an EIS.

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[5] The NRC defines a "categorical exclusion" as a category of actions which do not individually or cumulatively have a significant effect on the human environment and which the Commission has found to have no such effect in accordance with procedures set out in § 51.22, and for which, therefore, neither an environmental assessment nor an environmental impact statement is required. 10 CFR 51.14(a). The NRC's list of categorical exclusions is set forth in § 51.22.

[6] The NRC defines an "environmental assessment" as a concise public document …that serves to: (1) Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. (2) Aid the Commission's compliance with NEPA when no environmental impact statement is necessary. (3) Facilitate preparation of an environmental impact statement when one is necessary. 10 CFR 51.14(a).

[7] The terms "nuclear reactor" and "testing facility" are defined in § 50.2, "Definitions."

The NRC's regulation at § 51.45 requires a reactor applicant to submit an environmental report that discusses: 1) the impact of the proposed action on the environment, 2) any adverse environmental impacts that cannot be avoided, 3) alternatives to the proposed action, 4) the relationship between local short-term uses of the environment and maintenance and enhancement of long-term productivity, and 5) any irreversible or irretrievable commitments of resources. In addition, the licensee is required to include within its environmental report, an analysis that considers and balances the environmental effects of the proposed action and the alternatives available for reducing or avoiding adverse environmental effects, as well as the benefits of the action. The NRC will independently evaluate the applicant's environmental report as part of the NRC's preparation of the draft EIS.

Before issuing a construction permit or an operating license for a nuclear plant under 10 CFR part 50 or an early site permit or combined license (that does not reference an early site permit for the proposed facility) under 10 CFR part 52, the NRC is required to prepare a draft EIS that assesses the potential environmental impacts that may result from the construction, operation, and decommissioning of the proposed nuclear reactor plant. In preparing the draft EIS, the NRC staff will analyze the potential environmental impacts in regard to different aspects or resources of the human environment (e.g., air quality). Within each environmental aspect or resource area, the NRC staff will identify and analyze issues that correspond to specific, potential environmental impacts (e.g., within the air quality resource area, the criteria pollutant emissions likely to result during construction). In the draft EIS, the NRC staff also evaluates alternatives to the proposed action.

After analyzing the potential environmental impacts for each issue,[8] the NRC assigns one of the following three significance levels to describe its evaluation of those impacts on that issue:

SMALL – The environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the 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 as the term is used in this definition.

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

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

For issues where probability is a key consideration (i.e., accident consequences), probability is a factor in determining significance.

The NRC will document its environmental review and analysis through the preparation of a draft EIS that will be published for public comment in the *Federal Register*, with a minimum 45-day comment period, in accordance with § 51.73. Further, as provided in § 51.74, the NRC will distribute the draft EIS to the Environmental Protection Agency, Federal agencies that have a special expertise or jurisdiction with respect to any potential environmental impact that may be relevant to the proposed action, the applicant, and appropriate State, Tribal, and local agencies and clearinghouses.

[8] Each issue corresponds to a specific type of environmental impact potentially resulting from building, operating, or decommissioning of an advanced nuclear reactor.

Following the public comment period, the NRC will analyze any comments received, revise its environmental analyses as appropriate, and then prepare the final EIS in accordance with the requirements of § 51.91.[9] Pursuant to § 51.93, the NRC will distribute the final EIS to many of the same entities as the draft EIS and to each commenter. The NRC also will publish a notice of availability for the final EIS in the *Federal Register*. As set forth in § 51.102 and following the preparation and distribution of the final EIS, the Commission will prepare and issue the record of decision, which is a concise, publicly available statement that documents the NRC's decision, as informed by the final EIS. The requirements for a record of decision are described in § 51.103, and include stating the Commission's decision (e.g., the approval or disapproval of the nuclear reactor application), identifying the alternatives (including the proposed action) considered by the Commission, and a statement as to whether the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted (e.g., lack of jurisdiction or authority). In cases of an adjudicatory proceeding before the NRC's Atomic Safety and Licensing Board (ASLB), the initial decision of the presiding officer, or if appealed, the final decision of the Commission, will constitute the record of decision. To meet the § 51.102 requirement that the record of decision be a concise document, the NRC staff will also prepare a "Summary Record of Decision,"

[9] For a 10 CFR part 52 combined license that references an early site permit, the NRC will prepare a supplement to the final EIS for the early site permit in accordance with § 51.92(e) and will provide an opportunity for public comment on the supplement pursuant to § 51.92(f)(1). Similarly, for a 10 CFR part 50 operating license, the NRC will prepare a supplement to the final EIS for the construction permit in accordance with § 51.95(b) and will provide an opportunity for public comment on the supplement pursuant to § 51.95(a).

signed by the NRC's Director, Office of Nuclear Reactor Regulation, that summarizes the presiding officer's initial, or the Commission's final, decision.[10]

C. Use of Rulemaking and Generic Environmental Impact Statements

The use of rulemaking to adopt improvements to the licensing process for classes of applicants, such as reactor applicants, has several advantages, including the following, which were identified in a 1978 NRC interim policy statement:[11] 1) enhance stability and predictability of the licensing process by providing regulatory criteria and requirements in discrete generic areas on matters which are significant in the review and approval of license applications; 2) enhance public understanding and confidence in the integrity of the licensing process by bringing out for public participation important generic issues which are of concern to the agency and the public; 3) enhance administrative efficiency in licensing by removing, in whole or in part, generic issues from NRC staff review and adjudicatory resolution in individual licensing proceedings and/or by establishing the importance (or lack of importance) of various safety and environmental issues to the decision process; 4) assist the Commission in resolving complex methodology and policy issues involved in recurring issues in the review and approval of individual licensing applications; and 5) yield an overall savings in the utilization of resources in the licensing process by the utility industry, those of the public whose interest may be affected by the rulemaking, the NRC, and other Federal, State, and local governments with an expected improvement in the quality of the decision process.

[10] For the issuance of a 10 CFR part 50 operating license supported by a supplement prepared pursuant to § 51.95(b) that is uncontested (*i.e.*, no hearing before the NRC's ASLB), the Director, Office of Nuclear Reactor Regulation, will prepare the record of decision in accordance with § 51.103.

[11] Generic Rulemaking to Improve Nuclear Power Plant Licensing, Interim Policy Statement (43 FR 58377; December 14,1978).

The NRC has prepared the draft ANR GEIS, which provides generic findings with respect to many environmental issues. The NRC is proposing to codify these generic findings in 10 CFR part 51 to streamline and make more efficient the preparation of environmental reports by advanced nuclear reactor applicants and the NRC's subsequent environmental reviews. This proposed rule is consistent with past NRC part 51 rulemakings that adopted generic findings with respect to certain environmental issues related to the reactor licensing process. For example, Table S-3 in § 51.51 identifies the generic findings related to various environmental impacts of the nuclear fuel cycle.[12] Similarly, Table S-4 in § 51.52 bounds the environmental impacts of the transportation of radioactive waste and nuclear fuel for those applicants meeting certain criteria. Applicants that meet those criteria can use the information in Table S-4 as the basis for their evaluation of the potential environmental impacts of the transportation of radioactive waste and spent fuel. As such, these applicants are not required to conduct their own analysis of these impacts in their environmental reports and the NRC staff can likewise rely upon these findings when preparing its draft EIS.

Based upon past experience, the NRC has determined that the use of a GEIS and the codification of the generic findings into an NRC regulation is an efficient and thorough method of NEPA compliance when applied to a particular class of facilities or licensing and regulatory actions. Specifically, the NRC has relied upon the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437), which was issued in 1996 and updated in 2013, for operating power reactor license renewal actions, and the "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel" (NUREG-2157), which was issued in 2014,

[12] As described in § 51.51(a), the nuclear fuel cycle includes uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to these activities.

for the continued storage of spent fuel beyond the licensed life for operation of a reactor. In this regard, the NRC added appendix B to 10 CFR part 51, which codifies the generic findings of the NUREG-1437, and amended § 51.23, “Environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor,” which codifies the findings of NUREG-2157.

In particular, NUREG-1437 serves as a model for the preparation of the ANR GEIS. For each operating power reactor license renewal action, the NRC prepares a site-specific supplemental EIS (SEIS) that is issued as a supplement to NUREG-1437. To date, the NRC has issued 63 SEISs to NUREG-1437. The NUREG-1437 identifies the environmental issues that may apply to the renewal of an operating power reactor license. In NUREG-1437, the NRC staff determined that those issues that were common, or generic, to all nuclear reactors were identified as Category 1. Further, the NRC staff determined that the vast majority of the Category 1 issues were of a SMALL significance level.[13] Provided that neither the license renewal applicant nor the NRC identifies any new and significant information, no further analysis is needed for that issue by the applicant in its environmental report or by the NRC in its preparation of the draft SEIS. Those issues that cannot be resolved generically, identified as Category 2 issues, must be analyzed by both the applicant in its environmental report, and by the NRC in the draft SEIS. The applicant in its environmental report and the NRC in its draft SEIS must also address any new and significant information.

The NRC has codified the findings for the NUREG-1437 Category 1 issues into its regulations; the findings are listed in Table B-1 of appendix B to subpart A of 10 CFR

[13] Certain issues such as the offsite radiological impacts of spent nuclear fuel storage and high-level waste disposal were not given a significance level because of uncertainty; however, the Commission concluded that the impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the offsite radiological impacts of spent fuel and high-level waste disposal, these issues were considered to be Category 1 issues by the Commission.

part 51. The regulatory direction to use NUREG-1437 is set forth in § 51.53(c) for applicant environmental reports, in § 51.71(d) for the NRC staff's preparation of the draft SEIS, and in § 51.95(c) for the NRC staff's preparation of the final SEIS. In accordance with § 2.335(a), the codification of the generic findings and the direction to use NUREG-1437 for operating power reactor license renewal actions is significant as it bars any challenge to a generic finding or the NRC's reliance upon NUREG-1437 in a site-specific licensing proceeding before the NRC's ASLB.[14] A person seeking to challenge a codified generic finding must either file a petition for rulemaking pursuant to § 2.802 or, if a party to an ASLB proceeding, file a request to waive the regulation pursuant to § 2.335(b), such waiver being subject to Commission approval.

The use of a GEIS for NEPA compliance purposes by the NRC and the concomitant codification of generic findings into an NRC regulation has been upheld by Federal courts. In its 1983 decision, *Baltimore Gas and Electric Co. v. NRDC*, the Supreme Court adjudicated a challenge to Table S-3, codified at § 51.51.[15] The Court described Table S-3 as "a numerical compilation of the estimated resources used and effluents released by fuel cycle activities supporting a year's operation of a typical light-water reactor."[16] Section 51.51 requires that an environmental report, prepared by an applicant for a construction permit, an early site permit, or a combined license for a light-water-cooled nuclear power reactor, use the data in Table S-3 "as the basis for evaluating the contribution of the environmental effects" of all aspects of the uranium fuel cycle, such as uranium mining and milling, "to the environmental costs of licensing the

[14] 10 CFR 2.335(a) (no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities, source material, special nuclear material, or byproduct material, is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to this part).

[15] *Baltimore Gas and Electric Co. v. NRDC*, 462 U.S. 87 (1983).

[16] *Id*.

nuclear power reactor."[17] The Court held that "the generic method chosen by the [NRC] is clearly an appropriate method of conducting the hard look required by NEPA."[18] The Court further stated that "administrative efficiency and consistency of decision are both furthered by a generic determination of these effects without needless repetition of the litigation in individual proceedings, which are subject to review by the Commission in any event."[19] Lower Federal courts have applied the *Baltimore Gas* holding to the NRC's reliance on NUREG-1437 for operating power license renewal licensing actions.[20] Similarly, the NRC's codification of the generic findings of NUREG-2157 into § 51.23 have been upheld.[21]

III. Discussion

A. Proposed Amendments

The proposed amendments to 10 CFR part 51 would establish new requirements for environmental reviews of applications for an early site or construction permit or an operating or a combined license for advanced nuclear reactor facilities. The proposed rule's definition for an advanced nuclear reactor is based upon the statutory definition set forth in the Nuclear Energy Innovation and Modernization Act, Pub. L. 115-439, 132 Stat. 5565 (NEIMA). Section 3(1) of NEIMA defines an advanced nuclear reactor as one

[17] 10 CFR 51.51(a).

[18] *Baltimore Gas*, 462 U.S. at 101. The NEPA requires that a Federal agency "take a 'hard look' at the environmental consequences before taking a major action. *Id.*, at 97 *citing Kleppe v. Sierra Club*, 427 U.S. 390, 410, n. 21.

[19] *Id.*, at 101.

[20] *Massachusetts v. U.S. Nuclear Regulatory Commission*, 708 F.3d 63, 68 (1st Cir. 2013) (upholding the NRC's reliance upon NUREG-1437 and its codified findings in appendix B of subpart A, 10 CFR part 51).

[21] *New York v. U.S. Nuclear Regulatory Commission*, 824 F.3d 1012, 1019 (D.C. Cir. 2016) *citing New York v. U.S. Nuclear Regulatory Commission*, 681 F.3d 471, 480 (D.C. Cir. 2012) (the court stated that "the cornerstone of our holding was that the NRC may generically analyze risks that are 'essentially common' to all plants so long as that analysis is 'thorough and comprehensive.' In this case, we are convinced that the NRC has met that standard.").

having significant improvements compared to commercial nuclear reactors under construction as of January 14, 2019, the date of NEIMA's enactment.

Specifically, the proposed amendments would codify the generic conclusions of the draft ANR GEIS for those issues for which a generic conclusion regarding the potential environmental impacts of issuing a permit or license for an advanced nuclear reactor can be reached. These issues are identified as Category 1 issues in the ANR GEIS. Similar to the NUREG-1437, the Category 1 issues identified and described in the ANR GEIS may be applied to any advanced nuclear reactor application and have been determined to have a SMALL impact or significance level. The proposed appendix C to 10 CFR part 51 summarizes the Commission's findings for all Category 1 issues. In addition, the proposed amendments provide an applicant for an advanced nuclear reactor with the option to use the ANR GEIS, including the reliance upon its generic analyses and the Category 1 findings.

In this regard, an applicant can rely upon a given generic or Category 1 finding if it can demonstrate that the design of its proposed reactor facility and the parameters of the proposed site meet or are bounded by the values and assumptions of the ANR GEIS analysis supporting that Category 1 finding. For each Category 1 issue, each supporting value and assumption is further classified as being part of the plant parameter envelope (PPE) or the site parameter envelope (SPE). The PPE consists of those values and assumptions relating to the design and operation of the reactor facility, such as building height, water use, air emissions, employment levels, and noise generation levels. The SPE consists of those values and assumptions relating to the siting of the plant, such as the site size, size of water bodies supplying water to the reactor, and demographics of the region surrounding the site. The ANR GEIS provides the analysis evaluating the environmental impacts of a proposed reactor facility that fits within the bounds of the PPE on a site that fits within the bounds of the SPE. By using this approach, impact

analyses for the environmental issues common to many or most ANRs can be addressed generically, thereby eliminating the need to repeatedly reproduce the same analyses each time a licensing application is submitted and allowing applicants and the NRC staff to focus future environmental review efforts on issues that only can be resolved once a site and facility are identified.

Thus, if an applicant can demonstrate that the proposed reactor facility or the proposed site meets or is bounded by these PPE/SPE values and assumptions, then the applicant can adopt the conclusions of that Category 1 finding without having to conduct a project-specific analysis in its environmental report. Conversely, if an applicant cannot demonstrate that the proposed reactor facility or the proposed site meets or is bounded by these values and assumptions, or if the applicant determines that there is new and significant information regarding that Category 1 issue,[22] then the applicant cannot adopt the conclusions of that Category 1 finding. In such case, the applicant would then have to prepare a project-specific analysis for that issue in its environmental report.

Likewise, in preparing its draft SEIS, the NRC staff would rely upon those Category 1 findings for which the applicant has demonstrated meeting or being bounded by the underlying values and assumptions and would likewise not be required to include a project-specific analysis within the draft SEIS, unless the NRC staff became aware of new and significant information regarding that Category 1 issue. The Category 1 findings in proposed Table C-1 of the appendix can only be challenged in an individual ASLB licensing proceeding if a waiver is granted by the Commission in accordance with § 2.335(b).

[22] The proposed amendments would require the applicant, for each Category 1 finding that it relies upon in preparing its environmental report, to describe the process it used to determine whether there is any new and significant information that may change that Category 1 issue's generic analysis or finding. This proposed requirement is modeled after the requirement in § 51.50(c)(1)(iv) that has been used for new reactor combined license applications that referenced an early site permit.

The ANR GEIS also identifies and describes environmental issues for which a generic finding regarding the respective environmental impacts cannot be reached because the issue requires the consideration of project-specific information that can only be evaluated once the proposed site and facility are identified. The NRC classifies these issues as Category 2 issues in the ANR GEIS and within the proposed amendments. The NRC staff will prepare a project-specific analysis in the draft SEIS for each Category 2 issue, and for each Category 1 issue that the applicant cannot demonstrate that its project has met the underlying values and assumptions or for which there is new and significant information. The draft SEIS will also include the NRC staff's preliminary conclusions regarding the potential environmental impacts for each of these issues.

Two additional issues are designated as non-applicable (N/A) (i.e., impacts are uncertain) in the ANR GEIS, in that a classification of the issue as either Category 1 or 2 is not possible. These issues relate to human health effects from exposure to electromagnetic fields (EMFs) during both construction and operation. Because the state of the science is currently inadequate, no generic conclusion on human health impacts is possible for these issues. If, in the future, the Commission finds that a general agreement has been reached by appropriate Federal health agencies that there are adverse health effects from EMFs, the Commission will require applicants to submit plant-specific reviews of these health effects as part of their application. The proposed amendments do not require applicants to submit information on these issues in the environmental report nor will the NRC staff prepare a plant-specific analysis for these issues in the draft SEIS.

The NRC wishes to emphasize the importance of the public commenting at this time on environmental analyses set forth in the ANR GEIS, on the NRC's classification of the potential environmental impacts of the construction, operation and decommissioning of an advanced nuclear reactor as either a generic (Category 1) or

project-specific (Category 2) issue for each of the issues identified in the ANR GEIS, and on the proposed rule changes that would codify the generic findings of the ANR GEIS. After a final rule is published and effective, challenging the NRC's reliance upon a Category 1 issue in an individual advanced nuclear reactor permitting or licensing action will be prohibited except through an approved waiver in accordance with § 2.335(b). The Commission intends to periodically review the ANR GEIS findings contained in appendix C to 10 CFR part 51 and its supporting documentation and update them if necessary.

B. Environmental Impacts to be Reviewed

In the draft ANR GEIS, the NRC has preliminarily made generic findings that many of the potentially adverse environmental impacts of constructing, operating, and decommissioning an advanced nuclear reactor will be SMALL provided that the applicant's proposed reactor facility and the proposed site meets or is bounded by the respective values and assumptions supporting the Category 1 finding under consideration. See Section III.C. of this document for a more detailed discussion of the process used in the ANR GEIS.

The NRC divided its conclusions about environmental impacts in the ANR GEIS into the following three categories:

- **Category 1.** Environmental issues for which the NRC has been able to make a generic finding of SMALL adverse environmental impacts, or beneficial impacts, provided that the applicant's proposed reactor facility and site meet or are bounded by

the relevant values and assumptions in the PPE and SPE that support the generic finding for that Category 1 issue.[23]

- **Category 2.** Environmental issues for which a generic finding regarding the environmental impacts cannot be reached because the issue requires the consideration of project-specific information that can only be evaluated once the proposed site is identified. The impact significance (i.e., SMALL, MODERATE, or LARGE)[24] for these issues will be determined in a project-specific evaluation.

- **Not Applicable (N/A).** Environmental issues for which the state of the science is currently inadequate, and no generic conclusion on human health impacts is possible.

In the ANR GEIS, the NRC identifies a total of 121 environmental issues that may be associated with constructing, operating, and decommissioning an advanced nuclear reactor; of these issues, the NRC identified 100 environmental issues as Category 1 issues. Chapter 3 of the ANR GEIS provides the analyses supporting the generic finding of a SMALL significance level impact for each Category 1 issue and indicates the relevant values and assumptions in the PPE and SPE underlying the analyses. Applicants and the NRC staff may rely on the generic finding for each Category 1 issue, as codified in proposed Table C-1, provided that the applicant's proposed reactor facility and the proposed site meet or are bounded by the relevant values and assumptions for that Category 1 issue and that there is no new and significant information that changes the issue's generic analysis or finding, as determined by the NRC.

[23] Beneficial impacts may include increased tax revenues associated with the increased assessed value of new reactor projects, and other economic activity such as increases in local employment, labor income, and economic output.

[24] See Section II.B. of this document for a description of the SMALL, MODERATE, and LARGE significance levels used by the NRC in its EISs.

The ANR GEIS identifies 19 environmental issues as Category 2 issues. These issues cannot be evaluated generically and must be evaluated by the applicant, in its environmental report, and the NRC staff, in the draft SEIS, using project-specific information. For example, the Endangered Species Act of 1973 (ESA) requires every Federal agency to consult with the "Service"[25] and document its consideration of the impacts of its actions on threatened and endangered species and critical habitats. The NRC typically conducts this ESA analysis in parallel with its NEPA process.

Finally, for two environmental issues, the ANR GEIS identifies the category as N/A. The two issues concern the potential exposure to EMFs from construction and operation. Studies of 60 Hz EMFs have not uncovered consistent evidence linking harmful effects with field exposures. Because the state of the science is currently inadequate, no generic conclusion on human health impacts is possible. If, in the future, the Commission finds that a general agreement has been reached by appropriate Federal health agencies that there are adverse health effects from EMFs regarding these two issues, the Commission will then treat the issue in a manner similar to a Category 2 issue and require applicants to submit project-specific reviews of these health effects in their environmental report. Until such time, applicants are not required to submit information on these issues.

C. Generic Environmental Impact Statement

The purpose of the ANR GEIS is to present impact analyses for the environmental issues common to many or most advanced nuclear reactors that can be addressed generically, thereby eliminating the need to repeatedly reproduce the same

[25] Depending on the species impacted, the agency will consult with either the U.S. Fish & Wildlife Service (U.S. Department of the Interior) or the National Marine Fisheries Service (U.S. Department of Commerce), as provided in the Services' joint regulations at 50 CFR part 402.

analyses each time a licensing application is submitted and allowing applicants and NRC staff to focus future environmental review efforts on issues that can only be resolved once a site is identified. The ANR GEIS is intended to improve the efficiency of licensing advanced nuclear reactors by: 1) identifying the types of potential environmental impacts of constructing, operating, and decommissioning an advanced nuclear reactor, 2) assessing impacts that are expected to be generic (the same or similar) for many or most advanced nuclear reactors (Category 1 issues), and 3) defining the environmental issues that will need to be addressed in project-specific SEISs addressing specific projects (Category 2 issues). The NRC staff has preliminarily concluded in the draft ANR GEIS that the potential environmental impacts will be beneficial or of a SMALL adverse significance level.

In the ANR GEIS, the NRC staff evaluated the impacts of constructing, operating, and decommissioning an advanced nuclear reactor sited within the United States that meets or is bounded by the values and assumptions in the PPE and SPE for each Category 1 issue. The term "building," as used in the ANR GEIS, includes the full range of preconstruction activities (e.g., site grading) and NRC-authorized "construction" activities.[26] Further, the NRC staff assumed that the U.S. Army Corps of Engineers would be a cooperating agency for all advanced nuclear reactor applications, in accordance with the memorandum of understanding (MOU) between the two agencies dated September 19, 2008.[27] In this regard, the U.S. Army Corps of Engineers has been a cooperating agency since the MOU was signed in 2008. In addition, the ANR GEIS considered fuel cycle impacts and the impacts from continued storage of spent fuel,

[26] The NRC has regulatory authority over those construction activities that are related to radiological health and safety, physical security, or otherwise pertain to radiological controls. The NRC defines these activities as "construction" in § 51.4. As stated in § 51.45(c) preconstruction is defined as those activities listed in § 51.4(1)(ii).

[27] The MOU between the NRC and the U.S. Army Corps of Engineers dated September 19, 2008, is available in ADAMS under the accession number ML082540354.

including incorporating by reference the NRC's NUREG-2157, as further described below.

Because there may be multiple advanced nuclear reactor designs and an advanced nuclear reactor could be sited anywhere in the United States that meets the NRC siting requirements in 10 CFR part 100, the NRC applied a technology-neutral, performance-based approach using a PPE. The PPE consists of parameters for specific reactor design features regardless of the site. Examples of parameters include the permanent footprint of disturbance, building height, water use, air emissions, employment levels, and noise generation levels. For each PPE parameter, the NRC staff developed a set of bounding values and assumptions that if met, and absent any new and significant information, would demonstrate that the potential environmental impacts for that PPE parameter would be SMALL.

In addition, the NRC staff developed a set of site-related parameters termed the SPE. Examples of parameters include site size, size of water bodies supplying water to the reactor, and demographics of the region surrounding the site. For each SPE parameter, the NRC staff developed a set of bounding values and assumptions related to the condition of the affected environment, such as the extent and occurrence of nearby bodies of water, wetlands and floodplains, and proximity to sensitive noise receptors. Similar to a PPE parameter, if an applicant can demonstrate that the proposed reactor site meets the SPE parameter's bounding values and assumptions, and absent any new and significant information, then the potential environmental impacts for that SPE parameter would be SMALL. Under this proposed rule, a proposed reactor site would be determined to meet a given Category 1 issue if the applicant has demonstrated that it has met the bounding values and assumptions of each PPE and SPE parameter relevant to that Category 1 issue and that there is no new and significant information.

The PPE and SPE values and assumptions in the ANR GEIS were developed by an interdisciplinary team of subject matter experts (SMEs) assigned to prepare the ANR GEIS. The SMEs developed the values and assumptions based on one or more criteria, as described in the ANR GEIS.

The ANR GEIS identifies specific types of potential environmental impacts for 16 environmental resource areas: land use, visual resources, meteorology and air quality, water resources (surface and groundwater), terrestrial ecology, aquatic ecology, historic and cultural resources, environmental hazards (radiological and nonradiological), noise, waste management (radiological and nonradiological), postulated accidents, socioeconomics, environmental justice, fuel cycle, transportation of fuel and waste, and decommissioning. Each resource area includes one or more types of potential impacts, and each type of potential impact is termed an issue. In addition to the 16 environmental resource areas, the NRC staff considered climate change, cumulative impacts, purpose and need, need for power, site alternatives, energy alternatives, and system design alternatives. Each of the 121 issues that were identified corresponds to a specific type of environmental impact determined by the interdisciplinary team of SMEs that could potentially result from construction, operation, or decommissioning of an advanced nuclear reactor. For each issue, the SMEs then determined whether it would be possible to identify values and assumptions in the PPE and SPE that could effectively bound a meaningful generic analysis and provided the basis for each value and assumption. The SMEs then performed and described their generic analyses for each issue, for a hypothetical reactor/site that meets the PPE and SPE values and assumptions in the ANR GEIS. The values and assumptions were set such that the SMEs could reach a generic conclusion of SMALL adverse impacts, and the issue was then designated as a Category 1 issue. Issues for which the potential impacts are beneficial were also designated as Category 1. Issues for which the NRC staff could not

reach a generic conclusion were designated as Category 2 issues. In addition, two issues were placed in the category of N/A because the state of the science is currently inadequate, and no generic conclusion on human health impacts is possible.

An applicant addressing a Category 1 issue in its environmental report may refer to the generic analysis in the ANR GEIS for that issue and rely upon the generic finding of a SMALL significance level, without further analysis, provided that it demonstrates that the relevant values and assumptions of the PPE and SPE used in the resource analysis are met and there is no new and significant information that would require project-specific analysis. The applicant will have to document how the proposed reactor facility and the proposed site meet or are bounded by the applicable values and assumptions for that Category 1 issue. The extent of the information necessary to demonstrate that the applicant's project meets or is bounded by a given value or assumption will vary. In some cases, the demonstration may only require showing that the project falls within a parameter value or assumption (e.g., building height). But in other cases, analysis may be required to demonstrate that a value or assumption has been met (e.g., noise levels).

In its environmental report, the applicant would have to supply the requisite information necessary for the NRC staff to perform a project-specific analysis for 1) Category 1 issues for which the relevant values and assumptions are not met, or for which new and significant information was identified, and 2) all Category 2 issues. Guidance for applicants providing information to the NRC staff in an environmental report is available in RG 4.2, "Preparation of Environmental Reports for Nuclear Power Stations." If a project-specific analysis is required for a Category 1 issue, the applicant may be able to incorporate by reference all or part of the generic analysis provided in the ANR GEIS as a part of its analysis and focus on providing any additional project-specific information needed to support its conclusion.

After the applicant submits its environmental report, the NRC staff will prepare the draft SEIS, and following the public comment period, the final SEIS. When considering a Category 1 issue in a SEIS, the NRC staff will likewise refer to the generic analysis in the ANR GEIS for that issue without further analysis, provided that the relevant values and assumptions in the PPE and SPE are met and there is no new and significant information that changes the generic finding for that Category 1 issue. The NRC staff also will document that the applicant has demonstrated that the values and assumptions are met for that issue. The NRC staff will complete a project-specific analysis in accordance with the latest version of the Environmental Standard Review Plan or related guidance (such as any relevant interim staff guidance) for 1) Category 1 issues for which the relevant values and assumptions are not met, or for which new and significant information was identified, and 2) all Category 2 issues. If a project-specific analysis is required for a Category 1 issue, the NRC staff may be able to incorporate by reference all or part of the generic analysis provided in the ANR GEIS as a part of its analysis and focus on providing any additional project-specific information needed to support its conclusion.

D. Summary of Issues Analyzed in the ANR GEIS

The following describes those environmental issues that were examined for the ANR GEIS and summarizes the conclusions by resource area. The determination that an applicant can rely on the finding for a Category 1 issue assumes that the applicant can demonstrate that its proposed reactor facility and the proposed site meet or is bounded by all the respective values and assumptions of that Category 1 issue, and further, that there is no new and significant information.

1. *Land Use*

The NRC staff evaluated the potential impacts to onsite and offsite land use for both construction and operation. In addition, the NRC staff considered the impacts of the project in accordance with the Coastal Zone Management Act and the Farmland Protection Policy Act, if applicable. The NRC staff concluded that all identified issues can be classified as Category 1 issues.

2. *Visual Resources*

The NRC staff evaluated the potential visual impacts in the site and vicinity and along the transmission lines for both the construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues.

3. *Meteorology and Air Quality*

The NRC staff evaluated the potential air quality impacts from the emissions of criteria pollutants, dust and hazardous pollutants, and greenhouse gas emissions for both construction and operation. In addition, the NRC staff considered the potential operations-related air quality impacts from cooling-system emissions and the emission of ozone and nitrogen oxides during transmission line operations. The NRC staff concluded that all identified issues can be classified as Category 1 issues.

4. *Water Resources*

The NRC staff evaluated the potential impacts to water use and water quality for both surface water and groundwater for both construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues, with one exception. The NRC staff determined that surface water quality degradation due to chemical and thermal discharges could not be resolved generically because there was

no practical way to develop a comprehensive bounding set of water quality criteria, including both thermal and chemical criteria, for the PPE and SPE. Therefore, this issue is a Category 2 issue and thus requires a project-specific evaluation.

5. *Terrestrial Ecology*

The NRC staff evaluated the potential impacts to terrestrial wildlife, habitats, and wetlands for both construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues, with two exceptions. The NRC staff determined that the potential impacts to wildlife regulated under the ESA could not be generically resolved for either construction or operations because the NRC staff would need to consult individually with the U.S. Fish and Wildlife Service under ESA Section 7 regarding the potential effects of each specific licensing action. Therefore, these issues are Category 2 issues and thus require a project-specific evaluation.

6. *Aquatic Ecology*

The NRC staff evaluated the potential impacts to aquatic wildlife and habitats, for both construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues, with four exceptions. The NRC staff determined that the potential impacts to resources regulated under the ESA and the Magnuson-Stevens Fishery Conservation and Management Act could not be generically resolved for either construction or operations because the NRC staff would need to consult individually with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under ESA Section 7 and the Magnuson-Stevens Act regarding the potential effects of each specific licensing action. In addition, the NRC staff determined that potential thermal impacts on aquatic biota and other potential effects of cooling-water discharges on aquatic biota could not be resolved generically. For both of these issues, the NRC staff

would have to first review the discharge plume analysis and the aquatic biota potentially present before being able to reach a conclusion regarding the possible significance of impacts on the biota. Therefore, these four issues are Category 2 issues and thus require project-specific evaluations.

7. *Historic and Cultural Resources*

Both construction and operation of an advanced nuclear reactor have the potential to affect historic and cultural resources. The NRC staff would need to complete a project-specific consultation in accordance with Section 106 of the National Historic Preservation Act as part of its environmental review. Therefore, these two issues are Category 2 issues and thus require project-specific evaluations.

8. *Environmental Hazards*

This resource area encompasses both radiological impacts and nonradiological impacts. The NRC staff evaluated the potential impacts of environmental hazards for both construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues, with two exceptions. These two issues are the human health impacts of EMFs for both construction and operation. The NRC staff determined that because the state of the science regarding the human health impacts of EMFs is currently inadequate, no generic conclusion on those impacts is possible, and has classified these issues as Not Applicable (N/A). If, in the future, the Commission finds that a general agreement has been reached by appropriate Federal health agencies that there are adverse health effects from EMFs, the Commission will require applicants to submit plant-specific reviews of these health effects as part of their application. Until such time, applicants are not required to submit information on this issue.

9. *Noise*

The NRC staff evaluated the potential impacts of noise for both construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues.

10. *Waste Management*

This resource area encompasses the potential impacts of both radiological waste management and nonradiological waste management. The NRC staff evaluated the potential operational impacts of radiological waste management. In addition, the NRC staff evaluated the potential impacts of nonradiological waste management for both construction and operation. The NRC staff concluded that all identified issues can be classified as Category 1 issues.

11. *Postulated Accidents*

The NRC staff evaluated the potential operational impacts of postulated accidents (because these impacts occur only during operations). The NRC staff concluded that all identified issues can be classified as Category 1 issues, with one exception. The NRC staff determined that severe accidents are a Category 2 issue. Based on the analysis in the preliminary or final safety analysis report regarding severe accidents and probabilistic risk assessments, if an advanced nuclear reactor design has severe accident progressions that involve radiological or hazardous chemical releases, then a project-specific environmental risk evaluation must be performed.

12. *Socioeconomics*

The NRC staff evaluated the potential impacts of socioeconomics for both construction and operation. The NRC staff concluded that these two issues can be classified as Category 1 issues.

13. *Environmental Justice*

Both construction and operation may raise environmental justice issues. The NRC staff has determined that potential environmental justice impacts during construction or operations cannot be determined without the consideration of meaningful project-specific factors, and therefore, are Category 2 issues. Project-specific factors include the presence, geographic location, and size of specific minority or low-income populations; impact pathways derived from the plant design, layout, or site characteristics; or other community characteristics affecting specific minorities or low-income populations.

14. *Fuel Cycle*

The NRC staff evaluated the potential operational impacts of the fuel cycle (because these impacts do not occur during construction). The NRC staff concluded that all identified issues can be classified as Category 1 issues. However, because the values and assumptions do not encompass the potential fuel fabrication impacts for metal fuel and liquid-fueled molten salt, such fuels would require a project-specific analysis.

The ANR GEIS incorporates by reference NUREG-2157, in which the NRC evaluated the environmental impacts of the continued storage of spent nuclear fuel beyond the licensed life for the operation of light-water reactors (LWRs). In § 51.23, the NRC specifies that NUREG-2157 is deemed to be incorporated into the EIS for a new

reactor. However, NUREG-2157 did not evaluate the storage of spent nuclear fuel from non-LWRs. The NRC staff expects that many advanced nuclear reactors will not be LWRs. The ANR GEIS therefore evaluates the applicability of NUREG-2157 and determines that the findings in NUREG-2157 are applicable to non-LWR fuel, provided that the non-LWR fuel is stored in a manner that meets the regulatory requirements for spent fuel storage cask approval and fabrication in accordance with subpart L, "Approval of Spent Fuel Storage Casks," to 10 CFR part 72.

15. *Transportation*

The NRC staff evaluated the potential operational impacts of the transportation of fuel and waste to and from advanced nuclear reactors (because these impacts occur only during operations). The NRC staff concluded that all identified issues can be classified as Category 1 issues.

16. *Decommissioning*

The NRC staff evaluated all potential impacts of decommissioning an advanced nuclear reactor (e.g., air quality, radiological waste, land use). The NRC staff concluded that this issue can be classified as a Category 1 issue.

17. *Issues Applying Across Resources*

The NRC staff determined that the impacts related to climate change and the consideration of cumulative impacts could not be evaluated generically. As such, both of these issues have been classified as Category 2 issues and thus require a project-specific evaluation.

18. *Non-Resource Related Category 2 Issues*

The ANR GEIS addresses the environmental impact issues associated with constructing, operating, and decommissioning a new advanced nuclear reactor. However, the environmental report and the NRC staff's SEIS must also include other information, as required by the regulations and discussed in regulatory guidance. These are not resource-specific issues. Rather, they are project-specific issues, not tied to any specific environmental resource, that are necessary to support the NRC staff's completion of its environmental review in accordance with NEPA. These issues cannot be evaluated generically and must be addressed in the environmental report and SEIS using project-specific information. In the ANR GEIS, the NRC staff identified the following issues: purpose and need, need for power, site alternatives, energy alternatives, and system design alternatives. This list is not all-inclusive. NRC regulations at 10 CFR part 51 and guidance such as RG 4.2 describe information not included in this list that must be included as part of an application.

E. Public Comments on Notice of Exploratory Process and Notice of Intent to Prepare a Generic Environmental Impact Statement

On November 15, 2019 (84 FR 62559), the NRC published in the *Federal Register* a notice announcing an exploratory process and soliciting comments to determine the possibility of developing a GEIS for licensing advanced nuclear reactors. The exploratory process included two public meetings, a public workshop attended by multiple stakeholders, and a site visit to the Idaho National Laboratory, a location that is being contemplated for construction and operation of advanced nuclear reactors.

Advice and recommendations on the possibility of preparing an ANR GEIS were invited from all interested persons. Comments were specifically requested on the whether the scope of the ANR GEIS should include reactors regardless of technology or

be limited to specific reactor technologies, what reactor sizes (footprint) and power levels should be included in the scope of the ANR GEIS, whether the geographical site of a reactor should be considered in developing the scope of the ANR GEIS, and whether a set of bounding plant parameters should be consider in developing the scope of the ANR GEIS, and if so, what parameters should be considered.

The NRC received comments that both supported and opposed the development of an ANR GEIS. Commenters who supported development of an ANR GEIS stated that it would improve the efficiency of the environmental review process, would avoid duplication of effort, and would focus future reviews on important environmental issues. Commenters who did not support development of an ANR GEIS stated that an ANR GEIS would be premature at this time and that the NRC staff did not have sufficient information available to resolve issues generically. Based on the results of the exploratory process, the NRC staff concluded that there was sufficient information to complete an ANR GEIS which would generically resolve many environmental issues, save resources for individual reviews, and provide predictability for potential applicants in developing their applications. The results of the exploratory process were summarized in SECY-20-0020, "Results of Exploratory Process for Developing a Generic Environmental Impact Statement for the Construction and Operation of Advanced Nuclear Reactors," issued on February 28, 2020.

On April 30, 2020 (85 FR 24040), the NRC published in the *Federal Register* a notice of intent to prepare an ANR GEIS. Advice and recommendations on the scope of the ANR GEIS were invited from all interested persons.

Comments were requested regarding the parameters that the NRC should use to bound the advanced nuclear reactors in the PPE (including power level and size of the site) and the parameters that should be used to bound the affected environment in the

SPE. In addition, comments were requested on resources or issues that could be resolved generically and ones that could not.

The NRC received comments concerning the NEPA process, the PPE and SPE, hydrology, socioeconomics, environmental justice, historic and cultural resources, climate change, radiological health, uranium fuel cycle, accidents, transportation of spent fuel, and need for power. The NRC also received general comments in support of and opposition to the ANR GEIS, and comments concerning issues outside the scope of the ANR GEIS. A summary of comments and the NRC staff response are available in the scoping summary report issued on September 25, 2020.

IV. Specific Requests for Comment

The NRC is seeking public comment on this proposed rule, the ANR GEIS, draft regulatory guide (DG), DG-4032, "Preparation of Environmental Reports for Nuclear Power Stations," and draft Interim Staff Guidance COL-ISG-030, "Environmental Considerations Associated with Advanced Nuclear Reactor Applications that Reference the Generic Environmental Impact Statement (NUREG-2249)." In addition, the NRC staff developed two draft documents referenced in DG-4032, the "Energy and System Design Mitigation Alternatives White Paper" ("White Paper") and "Recommendations for an Applicant to Calculate Activity Data for Greenhouse Gases Estimates" ("GHG Estimates"). These documents are references to DG-4032 and, therefore, are open to review and comment from the public. The DG-4032, COL ISG-030, the White Paper, and the GHG Estimates document are described in Section XIV, "Availability of Guidance," of this document.

Further, the NRC staff is particularly interested in comments and supporting rationale from the public on the following:

1. *Plant parameter envelope and site parameter envelope values and assumptions*: If a commenter believes the NRC staff is using an inappropriate value to result in a SMALL impact (either too restrictive, or not restrictive enough), explain the basis for that position and provide an alternative proposed parameter value.

2. *Environmental issues evaluated*: Are there any environmental issues that the NRC staff did not include in the scope of the ANR GEIS and the proposed rule that should be included? Commenters should provide the basis for considering any proposed environmental issues.

3. *Categorization of issues*: Are the environmental issues categorized appropriately? In other words, are there Category 1 issues that should be Category 2, or Category 2 issues that should be Category 1? Provide a basis for such conclusions.

4. *Scope of proposed rule changes*: Do the proposed revisions adequately address all licensing scenarios associated with evaluating the environmental impacts of permitting and licensing advanced nuclear reactor construction and operation? For example, no changes are proposed to § 51.49, "Environmental report–limited work authorization," or § 51.53(b), "Post-construction environmental report–operating license stage," because these provisions already reference the requirements of § 51.50, which is modified by the proposed rule. Commenters should clearly specify any proposed regulatory text additions or changes and provide the basis for such proposed changes.

5. *Guidance for applicants*: Are the methods described in the draft revision to RG 4.2 for demonstrating values and assumptions appropriate? Describe and justify any methods that the commenter believes are not appropriate.

6. *Limited Work Authorizations*: Should the NRC expand the ANR GEIS and the rule to include NRC approval of limited work authorizations (LWAs)[28] for advanced nuclear reactor applications? Specifically, should an LWA applicant that demonstrates that its proposed project meets or is bounded by the PPE and SPE values and assumptions for a given Category 1 issue, be able to rely on the generic findings for that issue in preparing the environmental report that it will submit in support of its LWA application? Similarly, should the NRC be able to rely on the generic findings for that Category 1 issue in preparing its supplemental environmental impact statement? If the NRC were to expand the ANR GEIS and the rule to include NRC approval of LWAs, the expansion would cover both LWAs submitted as a stand-alone application and an LWA request submitted in conjunction with an application for another form of NRC approval described in the ANR GEIS and in the proposed rule (e.g., a construction permit application).

V. Section-by-Section Analysis

The following paragraphs describe the specific changes proposed by this proposed rule.

Section 51.14, Definitions

The NRC proposes to amend paragraph (a) by adding a definition for *advanced nuclear reactor* based on the definition from NEIMA.

[28] A LWA permits a nuclear power plant applicant to engage in certain reactor construction activities before the NRC issues a 10 CFR part 50 construction permit or a 10 CFR part 52 combined license. The applicable NRC regulations for LWAs include §§ 50.10, 52.1(a), 52,17(c), 52.24, 52.27, 52.80, and 52.91. The NRC last amended its LWA regulations in 2007 (72 FR 57416; October 9, 2007).

Section 51.50, Environmental report—construction permit, early site permit, or combined license stage

The NRC proposes to amend paragraph (a) by adding a new second sentence regarding the requirement for non-LWR applicants to address fuel cycle impacts, making this paragraph consistent with the existing language in paragraphs (b) and (c).

The NRC proposes to add a new paragraph (d) to address the application for a construction permit, early site permit, or combined license for an advanced nuclear reactor facility.

Section 51.75, Draft environmental impact statement—construction permit, early site permit, or combined license

The NRC proposes to add a new paragraph (d) to provide direction on the preparation of a draft supplemental environmental impact statement for an application for a construction permit, early site permit, or combined license for an advanced nuclear reactor facility.

Section 51.96, Advanced nuclear reactor environmental impact statements

The NRC proposes to add a new section to provide direction on preparation of a final supplemental environmental impact statement for an advanced nuclear reactor application.

Appendix C to Subpart A, Environmental Effect of Issuing a Permit or License for an Advanced Nuclear Reactor

The NRC proposes to add appendix C to add a table to codify ANR GEIS findings and to specify values and assumptions that need to be met by the applicant to adopt Category 1 conclusions.

VI. Initial Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980 (RFA), as amended at 5 U.S.C. 601 *et seq*, requires that agencies consider the impact of their rulemakings on small entities and, consistent with applicable statutes, consider alternatives to minimize these impacts on the businesses, organizations, and government jurisdictions to which they apply.

In accordance with the Small Business Administration's regulation at 13 CFR 121.903(c), the NRC has developed its own size standards for performing an RFA analysis and has verified with the SBA Office of Advocacy that its size standards are appropriate for NRC analyses. The NRC size standards at 10 CFR 2.810 are used to determine whether an applicant or licensee qualifies as a small entity in the NRC's regulatory programs. Section 2.810 defines the following types of small entities:

small business is a for-profit concern and is a—(1) Concern that provides a service or a concern not engaged in manufacturing with average gross receipts of $7.0 million or less over its last 3 completed fiscal years; or (2) Manufacturing concern with an average number of 500 or fewer employees based upon employment during each pay period for the preceding 12 calendar months.

small organization is a not-for-profit organization which is independently owned and operated and has annual gross receipts of $7.0 million or less.

small governmental jurisdiction is a government of a city, county, town, township, village, school district, or special district with a population of less than 50,000.

small educational institution is one that is—(1) Supported by a qualifying small governmental jurisdiction; or (2) Not state or publicly supported and has 500 or fewer employees.

Number of Small Entities Affected

The NRC is currently aware of no known small entities as defined in § 2.810 that are planning to apply for an advanced nuclear reactor construction permit or operating license under 10 CFR part 50 or an early site permit or combined license under 10 CFR part 52, which would be impacted by this proposed rule. Based on this finding, the NRC has preliminarily determined that the proposed rule would not have a significant economic impact on a substantial number of small entities.

Economic Impact on Small Entities

Depending on how the ownership and/or operating responsibilities for such an enterprise were structured, applicants for an advanced nuclear reactor rated 8 MWe or less could conceivably meet the definition of small entities as defined by § 2.810. Owners that operate power reactors rated greater than 8 MWe could generate sufficient electricity revenue that exceeds the gross annual receipts limit of $7 million, assuming a 90 percent capacity factor and the June 2021 U.S. Department of Energy's Energy Information Administration U.S. average price of electricity to the ultimate customer for all sectors of 11.3 cents per kilowatthour. [29]

Although the NRC is not aware of any small entities that would be affected by the proposed rule, there is a possibility that future applications for an advanced nuclear reactor permit or license could be submitted by small entities who plan to own and operate an advanced nuclear reactor rated 8 MWe or less. Advanced nuclear reactors that are rated 8 MWe or less would most likely be used to support electrical demand for military bases, small remote towns, and process heat and would not directly compete with larger advanced nuclear reactors that typically produce electricity for the grid. As a result of these differing purposes, the NRC would expect that small and large entities would not be in direct competition with each other.

[29] https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a

Regulations at § 171.16(c) allow for certain NRC licensees to pay reduced annual fees if they qualify as small entities, although these regulations do not include licensees authorized to conduct activities under either 10 CFR part 50 or 10 CFR part 52. However, should a small entity apply for an advanced nuclear reactor license or permit, the small entity could request a one-time fee exemption. In subsequent years, the NRC licensee could submit a new request for a fee exemption for each fiscal year for which it desires an exemption. Additionally, after the small entity receives an operating license under 10 CFR part 50 or under part 52 and has completed power ascension testing, the small entity would be eligible for a reduced annual fee under § 171.15 based on the cumulative licensed thermal power rating of the reactor. The FY 2021 annual fee for each large operating power reactor is $4,749,000.

Therefore, the NRC preliminarily concludes that this proposed rule would not have a significant economic impact on a substantial number of small entities.

Request for Comments

The NRC is seeking comments on both its initial RFA analysis and on its preliminary conclusion that this proposed rule would not have a significant economic impact on a substantial number of small entities because of the likelihood that most expected applicants would not qualify as a small entity. Additionally, the NRC is seeking comments on its preliminary conclusion that if a small entity were to submit an advanced nuclear reactor application, the small entity would not incur a significant economic impact as it would most likely not be in competition with a large entity.

Any small entity that could be subject to this regulation that determines, because of its size, it is likely to bear a disproportionate adverse economic impact should notify the Commission of this opinion in a comment that indicates—

1) The applicant's size and how the proposed regulation would impose a significant economic burden on the applicant as compared to the economic burden on a larger applicant;

2) How the proposed regulations could be modified to take into account the applicant's differing needs or capabilities;

3) The benefits that would accrue or the detriments that would be avoided if the proposed regulations were modified as suggested by the applicant;

4) How the proposed regulation, as modified, would more closely equalize the impact of NRC regulations or create more equal access to the benefits of Federal programs as opposed to providing special advantages to any individual or group; and

5) How the proposed regulation, as modified, would still adequately meet the NRC's obligations under NEPA.

VII. Regulatory Analysis

The NRC has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of the alternatives considered by the NRC. The NRC requests public comment on the draft regulatory analysis. The regulatory analysis is available as indicated in the "Availability of Documents" section of this document. Comments on the draft analysis may be submitted to the NRC as indicated under the ADDRESSES caption of this document.

VIII. Backfitting and Issue Finality

The proposed rule would codify in 10 CFR part 51 certain environmental issues identified in the ANR GEIS. The proposed rule also revises 10 CFR part 51 to permit an

applicant for an advanced nuclear reactor construction permit or operating license under 10 CFR part 50, or an advanced nuclear reactor early site permit or combined license under 10 CFR part 52, to use the ANR GEIS in preparing its environmental report. The proposed rule would require the NRC staff to prepare a site-specific draft SEIS and final SEIS for each application that references the ANR GEIS. The NRC has determined that the backfitting rule in § 50.109 and the issue finality provisions in 10 CFR part 52 do not apply to this proposed rule because this amendment does not involve any provision that would either constitute backfitting as that term is defined in 10 CFR chapter I or affect the issue finality of any approval issued under 10 CFR part 52.

The proposed rule would not constitute backfitting for applicants for construction permits or operating licenses under 10 CFR part 50 and would not affect the issue finality of applicants for early site permits or combined licenses under 10 CFR part 52. These applicants are not, with certain exceptions not applicable here, within the scope of the backfitting or issue finality provisions. The backfitting and issue finality regulations include language delineating when the backfitting and issue finality provisions begin; in general, they begin after the issuance of a license, permit, or other approval (e.g., §§ 50.109(a)(1)(iii) and 52.98(a)). Furthermore, neither the backfitting provisions nor the issue finality provisions, with certain exceptions not applicable here, are intended to apply to NRC actions that substantially change the expectations of current and future applicants. Applicants cannot reasonably expect that future requirements will not change.

The exceptions to the general principle are applicable when an applicant references a 10 CFR part 52 approval (e.g., an early site permit or design certification rule) with specified issue finality provisions or a construction permit under 10 CFR part 50. However, this proposed rule would have no effect on a construction permit held by an applicant for a 10 CFR part 50 operating license or an early site permit referenced

by an applicant for a 10 CFR part 52 combined license. Therefore, for purposes of this proposed rule, the exceptions to the general principle do not apply.

IX. Cumulative Effects of Regulation

The NRC is following its cumulative effects of regulation (CER) process by engaging with external stakeholders throughout the rulemaking and related regulatory activities. Public involvement has included 1) the publication of a notice announcing an exploratory process and opportunity for comment to determine the possible utility of developing an ANR GEIS on November 15, 2019 (84 FR 62559); 2) public meetings on November 15 and November 20, 2019, and a workshop on January 8, 2020, to gather information for the exploratory process; 3) the publication of a notice of intent to conduct scoping and prepare an ANR GEIS on April 30, 2020 (85 FR 24040); 4) a public meeting on May 28, 2020, to receive comments on the scope of the ANR GEIS; and 5) public meetings on October 1, 2020; March 8, 2021; and April 15, 2021 to share information about the NRC's progress on the development of the ANR GEIS.

The NRC is issuing draft guidance along with this proposed rule to support more informed external stakeholder understanding and feedback. The draft guidance is available as indicated in the "Availability of Documents" section of this document. Further, the NRC will continue to hold public meetings throughout the rulemaking process.

In addition to the questions on the implementation of this proposed rule presented in the "Specific Requests for Comments" section of this document, the NRC is requesting CER feedback on the following questions:

1. If CER challenges currently exist or are expected, what should be done to address them?

2. Do other (NRC or other agency) regulatory actions (e.g., orders, generic communications, license amendment requests, inspection findings of a generic nature) influence the implementation of this proposed rule's requirements?

3. Are there unintended consequences? Does the proposed rule create conditions that would be contrary to this proposed rule's purpose and objectives? If so, what are the unintended consequences, and how should they be addressed?

4. Please comment on the NRC's cost and benefit estimates in the draft regulatory analysis that supports the proposed rule. The regulatory analysis is available as indicated in the "Availability of Documents" section of this document.

X. Plain Writing

The Plain Writing Act of 2010 (Pub. L. 111-274) requires Federal agencies to write documents in a clear, concise, and well-organized manner. The NRC has written this document to be consistent with the Plain Writing Act as well as the Presidential Memorandum, "Plain Language in Government Writing," published June 10, 1998 (63 FR 31885). The NRC requests comment on this document with respect to the clarity and effectiveness of the language used.

XI. National Environmental Policy Act

The NRC has determined that this proposed rule is the type of action described in § 51.22(c)(3), an NRC categorical exclusion. Therefore, neither an environmental impact statement nor environmental assessment has been prepared for this proposed rule. This action is procedural in nature in that it pertains to the type of environmental information to be reviewed.

XII. Paperwork Reduction Act

This proposed rule contains new or amended collections of information subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq). This proposed rule has been submitted to the Office of Management and Budget for review and approval of the information collections.

Type of submission: Revision

The title of the information collection: 10 CFR Part 51, Advanced Nuclear Reactor Generic Environmental Impact Statement

The form number if applicable: Not applicable.

How often the collection is required or requested: On occasion.

Who will be required or asked to respond: Applicants for advanced nuclear reactors.

An estimate of the number of annual responses: 0.3

The estimated number of annual respondents: 0.3

An estimate of the total number of hours needed annually to comply with the information collection requirement or request: A burden reduction of 1,964 hours

Abstract: The NRC is proposing to amend the regulations that govern the NRC's environmental reviews of advanced nuclear reactor applications under NEPA. The NRC's regulations in § 51.45 require each applicant to prepare and submit an environmental report which includes, among other things, a description of the proposed action, a statement of its purposes, a description of the environment affected, and a discussion of the environmental impacts of the proposed action and alternatives. The rulemaking would codify the generic findings of the ANR GEIS, which presents impact analyses for the environmental issues common to many or most advanced nuclear reactors that can be addressed generically, thereby eliminating the need to repeatedly

reproduce the same analyses each time a licensing application is submitted. The proposed rule would reduce burden on an applicant because they would not be required to assess the environmental impacts of ANR GEIS Category 1 issues if: 1) the applicant has demonstrated that it has met the bounding values and assumption of each PPE and SPE parameter relevant to that Category 1 issue, and 2) the applicant has not identified any new and significant information that would change a conclusion in the ANR GEIS. If a value or assumption is not met, then the applicant may be able to limit its analysis to just the impact of not meeting the value or assumption. Similarly, if the applicant identifies new and significant information that would change a conclusion in the ANR GEIS, then the applicant may be able to limit its analysis to just the impact of the new and significant information. To comply with NEPA, the NRC uses the information in the environmental report along other information to conduct an independent environmental evaluation.

The NRC is seeking public comment on the potential impact of the information collection contained in this proposed rule and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?

2. Is the estimate of the burden of the proposed information collection accurate?

3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?

4. How can the burden of the proposed information collection on respondents be minimized, including the use of automated collection techniques or other forms of information technology?

A copy of the Office of Management and Budget (OMB) clearance package and proposed rule is available in ADAMS under Accession No. ML21222A060 or may be obtained free of charge by contacting the NRC's Public Document Room reference staff

at 1-800-397-4209, at 301-415-4737, or by email to PDR.resource@nrc.gov. You may obtain information and comment submissions related to the OMB clearance package by searching on https://www.regulations.gov under Docket ID NRC-2020-0101.

You may submit comments on any aspect of these proposed information collections, including suggestions for reducing the burden and on the above issues, by the following methods:

- **Federal rulemaking website:** Go to https://www.regulations.gov and search for Docket ID NRC-2020-0101.
- **Mail comments to:** FOIA, Library, and Information Collections Branch, Office of the Chief Information Officer, Mail Stop: T6-A10M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001 or to the OMB reviewer at OMB Office of Information and Regulatory Affairs (3150-0021), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: oira_submission@omb.eop.gov.

Submit comments by **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the NRC is able to ensure consideration only for comments received on or before this date.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

XIII. Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Pub. L. 104-113, requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless using such a standard is inconsistent with applicable law or otherwise impractical. This proposed rule, which amends various provisions of 10 CFR part 51, does not constitute the establishment of a standard that contains generally applicable requirements.

XIV. Availability of Guidance

The NRC is issuing for comment two draft guidance documents, DG-4032, "Preparation of Environmental Reports for Nuclear Power Stations," and draft interim staff guidance (ISG) document COL-ISG-030, "Environmental Considerations Associated with Advanced Nuclear Reactor Applications that Reference the Generic Environmental Impact Statement (NUREG-2249) – Interim Staff Guidance," to support implementation of the requirements in this proposed rule. The guidance documents are available as indicated in the "Availability of Documents" section of this document. You may submit comments on the draft regulatory guidance by the methods provided in the ADDRESSES section of this document.

The DG-4032 has been prepared as a revision to RG 4.2, "Preparation of Environmental Reports for Nuclear Power Stations." The revision updates and re-titles Appendix C to the regulatory guide, which previously provided guidance specifically for small modular reactors and non-LWRs and makes conforming changes to the body of the regulatory guide. The revisions provide supplemental guidance for applicants to establish a uniform format and content acceptable to the NRC staff for structuring and

presenting the environmental information to be compiled and submitted by an applicant for an advanced nuclear reactor permit or license. More specifically, the draft regulatory guide describes the content of environmental information to be included in an application for a permit or license for an advanced nuclear reactor, including the process for confirming the applicability of Category 1 issues, and criteria to address appropriate Category 1 and Category 2 issues, as specified in the proposed amendments to 10 CFR part 51. To assist the public in providing comments on DG-4032, the NRC has provided a redline/strikeout version that highlights substantial changes which can be accessed in ADAMS at Accession No. ML21274A152.

In addition, the NRC is seeking comment on two draft documents referenced in DG-4032, the "Energy and System Design Mitigation Alternatives White Paper" ("White Paper") and "Recommendations for an Applicant to Calculate Activity Data for Greenhouse Gases Estimates" ("GHG Estimates"). The draft White Paper describes the potential environmental impacts of various energy alternatives to the construction and operation of a new nuclear generating facility, including energy alternatives both requiring and not requiring new generation capacity. The draft GHG Estimates document provides guidance to advanced nuclear reactor applicants on estimating greenhouse gas emissions. The applicant could then rely upon the information provided in both the White Paper and the GHG Estimates documents, as appropriate, in preparing its environmental report that is submitted with its application. The draft White Paper and the draft GHG Estimates document can be accessed in ADAMS at Accession Nos. ML 21225A767 and ML21225A768 respectively.

The draft COL-ISG-030 supplements NUREG-1555, "Environmental Standard Review Plans," and will be incorporated into a future update to the NUREG. The ISG provides guidance for the NRC staff when performing a 10 CFR part 51 environmental review of an application for a permit or license for an advanced nuclear reactor. The

plan parallels the revisions to RG 4.2. The primary purpose of the ISG is to ensure that these reviews are focused on the significant environmental concerns associated with advanced nuclear reactor permitting or licensing as described in 10 CFR part 51. Specifically, it provides guidance to the NRC staff about environmental issues that should be reviewed and provides acceptance criteria to help the reviewer evaluate the information submitted as part of the permit or license application. It is also the intent of this review plan to make information about the regulatory process available and to improve communication between the NRC, interested members of the public, and the nuclear industry, thereby increasing understanding of the review process.

XV. Public Meeting

The NRC will conduct a public meeting to explain the changes in this proposed rule and to answer questions from the attendees to facilitate the development of public comments.

The NRC will hold one or more public meetings at NRC headquarters in Rockville, MD during the comment period. This meeting will include a webinar for those attending virtually. The public meeting and webinar will be conducted on MONTH DAY, 20XX from 1:00 - 4:00 p.m.

XVI. Availability of Documents

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated.

Document	ADAMS Accession No./*Federal Register* citation
Draft Generic Environmental Impact Statement	

Draft NUREG-2249, “Generic Environmental Impact Statement for Advanced Nuclear Reactors”	ML21222A055
Draft Guidance Documents	
Draft Regulatory Guide DG-4032, “Preparation of Environmental Reports for Nuclear Power Stations”	ML21208A120
Draft Regulatory Guide DG-4032, “Preparation of Environmental Reports for Nuclear Power Stations,” Redline/Strikeout Version to Support Public Comment	ML21274A152
Energy and System Design Mitigation Alternatives White Paper Report	ML21225A754
Recommendations for an Applicant to Calculate Activity Data for Greenhouse Gases Estimates	ML21225A768
Draft Interim Staff Guidance, COL-ISG-030, “Environmental Considerations Associated with Advanced Nuclear Reactor Applications that Reference the Generic Environmental Impact Statement (NUREG-2249)”	ML21227A005
Proposed Rule Documents	
Draft Regulatory Analysis for the 10 CFR Part 51, Advanced Nuclear Reactor Generic Environmental Impact Statement Proposed Rule	ML21222A057
Draft Information Collection Clearance Package	ML21222A060
Related Documents	
Advanced Nuclear Reactor Generic Environmental Impact Statement Scoping Process—Summary Report, September 2020	ML20260H180
Notice of Availability of Memorandum of Understanding Between U.S. Army Corps of Engineers and U.S. Nuclear Regulatory Commission on Environmental Reviews Related to the Issuance of Authorizations to Construct and Operate Nuclear Power Plants, dated September 25, 2008	73 FR 55546
NUREG-1437, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants,” Revision 1, dated June 2013	ML13107A023
NUREG-2157, “Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel,” dated September 2014	ML14198A440

SECY-20-0020, “Results of Exploratory Process for Developing a Generic Environmental Impact Statement for the Construction and Operation of Advanced Nuclear Reactors,” dated February 28, 2020	ML20052D175
SRM-SECY-20-0020, “Results of Exploratory Process for Developing a Generic Environmental Impact Statement for the Construction and Operation of Advanced Nuclear Reactors,” dated September 21, 2021	ML20265A112
SECY-XX-XXXX, “Proposed Rule: Advanced Nuclear Reactor Generic Environmental Impact Statement (RIN 3150-AK55; NRC-2020-0101)”	ML21222A044
Staff Requirements Memorandum for SECY-XX-XXXX, “Proposed Rule: Advanced Nuclear Reactor Generic Environmental Impact Statement (RIN 3150-AK55; NRC-2020-0101)”	MLXXXXXXXXX

The NRC may post documents related to this rule, including public comments, on the Federal rulemaking website at https://www.regulations.gov under Docket ID NRC-2020-0101.

List of Subjects in 10 CFR Part 51

Administrative practice and procedure, Environmental impact statements, Hazardous waste, Nuclear energy, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 552 and 553, the NRC is proposing to adopt the following amendments to 10 CFR part 51.

PART 51 – ENVIRONMENTAL PROTECTION REGULATIONS FOR DOMESTIC

LICENSING AND RELATED REGULATORY FUNCTIONS

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

Authority: Atomic Energy Act sec. 161, 1701 (42 U.S.C. 2201, 2297f); Energy Reorganization Act secs. 201, 202, 211 (42 U.S.C. 5841, 5842, 5851); Government Paperwork Elimination Act sec. 1704 (44 U.S.C. 3504 note). Subpart A also issued under National Environmental Policy Act secs. 102, 104, 105 (42 U.S.C. 4332, 4334, 4335); Pub. L. 95-604, Title II, 92 Stat. 3033-3041; Atomic Energy Act sec. 193 (42 U.S.C. 2243). Sections 51.20, 51.30, 51.60, 51.80. and 51.97 also issued under Nuclear Waste Policy Act secs. 135, 141, 148 (42 U.S.C. 10155, 10161, 10168). Section 51.22 also issued under Atomic Energy Act sec. 274 (42 U.S.C. 2021) and under Nuclear Waste Policy Act sec. 121 (42 U.S.C. 10141). Sections 51.43, 51.67, and 51.109 also issued under Nuclear Waste Policy Act sec. 114(f) (42 U.S.C. 10134(f)).

2. In § 51.14(a), add a new definition for *advanced nuclear reactor* in alphabetical order to read as follows:

§ 51.14 Definitions.

(a) * * *

Advanced nuclear reactor means a nuclear fission or fusion reactor that meets the definition of a production facility or utilization facility, as defined in § 50.2 of this chapter, including a prototype plant (as defined in §§ 50.2 and 52.1 of this chapter), with significant improvements compared to commercial nuclear reactors in operation or under construction as of January 14, 2019, as provided in section 3(1) of the Nuclear Energy Innovation and Modernization Act (NEIMA, Pub. L. 115-439, § 3(1), 132 Stat. 5565-66).

* * * * *

3. In § 51.50, in paragraph (a), add a new second sentence, and add paragraph (d) to read as follows:

§ 51.50 Environmental report—construction permit, early site permit, or combined license stage.

(a) * * * For other than light-water-cooled nuclear power reactors, the environmental report shall contain the basis for evaluating the contribution of the environmental effects of fuel cycle activities for the nuclear power reactor. * * * * * * * * *

(d) *Application for a construction permit, early site permit, or combined license for an advanced nuclear reactor facility.* If an application is for a construction permit for an advanced nuclear reactor, an early site permit for an advanced nuclear reactor, or a combined license for an advanced nuclear reactor that does not reference an early site permit, and further, if the applicant chooses to rely upon the findings of one or more of the issues identified as Category 1 issues in appendix C to subpart A of this part, then, in addition to the information and analyses required in paragraph (a), (b), or (c) of this section, as appropriate, the applicant's environmental report will be subject to the following conditions and considerations:

(1) The environmental report must contain information to demonstrate that the values and assumptions in appendix C to subpart A of this part are met, and no new and significant information is identified in accordance with paragraph (d)(5) of this section, for each Category 1 issue for which the applicant relies on the finding for that issue.

(2) The environmental report is not required to contain analyses of the environmental impacts of any issue identified as a Category 1 issue in appendix C to subpart A of this part, provided that the environmental report contains the information specified in paragraph (d)(1) of this section.

(3) The environmental report must contain analyses of the environmental impacts of the proposed action, including the construction, operation, and decommissioning of the proposed advanced nuclear reactor facility, for:

i) Any Category 1 issue for which the values and assumptions are not met or for which new and significant information is identified in accordance with paragraph (d)(5) of this section; and

ii) Each issue identified as a Category 2 issue in appendix C to subpart A of this part.

(4) The environmental report must contain a consideration of alternatives for reducing adverse environmental impacts, as required by § 51.45(c), for all issues identified as Category 1 issues in appendix C to subpart A of this part for which the environmental report does not contain the information specified in paragraph (d)(1) of this section, and for all issues identified as Category 2 issues in appendix C to subpart A of this part. No such consideration is required for Category 1 issues in appendix C to subpart A of this part that meet the applicable values and assumptions as specified in paragraph (d)(1) of this section.

(5) The environmental report must contain any new and significant information of which the applicant is aware regarding the environmental impacts for all issues identified as Category 1 issues in appendix C to subpart A of this part for which the applicant relies on the findings for those issues.

(6) The environmental report must contain a description of the process used to identify new and significant information regarding the issues identified as Category 1 issues in appendix C to subpart A of this part for which the applicant relies on the findings for those issues.

4. In § 51.75, add paragraph (d) to read as follows:

§ 51.75 Draft environmental impact statement—construction permit, early site permit, or combined license.

* * * * *

(d) *Construction permit, early site permit, or combined license for an advanced nuclear reactor facility*. If a draft environmental impact statement is being prepared in accordance with paragraphs (a), (b), or (c) of this section, and if the draft environmental impact statement concerns the permitting or licensing of an advanced nuclear reactor, and further, if the applicant's environmental report, relied upon the findings of one or more of the issues identified as Category 1 issues in appendix C to subpart A of this part, the draft environmental impact statement must be prepared as a supplement to NUREG-2249, "Generic Environmental Impact Statement for Advanced Nuclear Reactors" ([MONTH] 2022), which is available in the NRC's Public Document Room, 11555 Rockville Pike, Rockville, Maryland 20852. In addition, the NRC staff must comply with 40 CFR 1506.6(b)(3) in conducting the additional scoping process as required by § 51.71(a). The draft supplemental environmental impact statement will incorporate the conclusions in NUREG-2249 for issues identified as Category 1 for which the applicant has demonstrated that the applicable values and assumptions have been met and for which neither the applicant nor the NRC identified any new and significant information. The draft supplemental environmental impact statement must contain an analysis for those issues identified as Category 1 for which the applicant could not demonstrate that the applicable values and assumptions were met or for which any new and significant information was identified by the applicant or the NRC, and for those issues identified as Category 2.

5. Add new § 51.96 to read as follows:

§ 51.96 Final supplemental environmental impact statement—advanced nuclear reactor.

(a) In connection with an advanced nuclear reactor construction permit for a production or utilization facility under part 50 of this chapter or an advanced nuclear reactor early site permit or combined license that does not reference an early site permit for a production or utilization facility under part 52 of this chapter, and for which the NRC staff relied on any of the findings in appendix C to subpart A of this part in preparing a draft supplemental environmental impact statement in accordance with § 51.75(d), the NRC shall prepare a final supplemental environmental impact statement, which is a supplement to the Commission's NUREG-2249, "Generic Environmental Impact Statement for Advanced Nuclear Reactors" ([MONTH] 2022), and available in the NRC's Public Document Room, 11555 Rockville Pike, Rockville, Maryland 20852.

(b) The final supplemental environmental impact statement required by paragraph (a) of this section must contain the NRC staff's recommendation regarding the environmental acceptability of approving the construction permit, the early site permit, or the combined license. In order to make recommendations and reach a final decision on the proposed action, the NRC staff, adjudicatory officers, and Commission shall integrate:

(1) The conclusions in NUREG-2249 for issues designated as Category 1 for which the applicant has demonstrated that the applicable values and assumptions have been met and for which neither the applicant nor the NRC staff identified any new and significant information with

(2) Information developed for those Category 1 issues for which the applicant could not demonstrate that the applicable values and assumptions were met and those Category 2 issues applicable to the plant under § 51.50(d) and any new and significant information.

(c) The final supplemental environmental impact statement required by paragraph (a) of this section shall address those issues as required by § 51.91 and shall be distributed in accordance with § 51.93.

(d) In connection with an advanced nuclear reactor combined license that references an early site permit for a production or utilization facility under part 52 of this chapter, and for which the NRC staff relied on any of the findings in appendix C to subpart A of this part in preparing the supplemental environmental impact statement for that early site permit, the NRC shall prepare a supplement to that final supplemental environmental impact statement. The supplement must meet the requirements of § 51.92(e) and shall be considered a supplement to NUREG-2249.

(e) In connection with an advanced nuclear reactor combined license that references an early site permit for a production or utilization facility under part 52 of this chapter, and for which the staff relied on any of the findings in appendix C to subpart A of this part in preparing the draft supplemental environmental impact statement, the NRC staff shall prepare a supplement to the early site permit environmental impact statement. The supplement must be prepared in accordance with § 51.92(e) and shall be considered a supplement to NUREG-2249.

(f) In connection with the issuance of an advanced nuclear reactor operating license under part 50 of this chapter, and for which the NRC staff relied on any of the findings in appendix C to subpart A of this part in preparing the supplemental environmental impact statement for the construction permit for that facility, the NRC shall prepare a supplement to the final supplemental environmental impact statement. The supplement must meet the requirements of § 51.95(b) and shall be considered a supplement to NUREG-2249.

6. Add appendix C to subpart A of part 51 to read as follows:

Appendix C to Subpart A—Environmental Effect of Issuing a Permit or License for an Advanced Nuclear Reactor

The Commission has assessed the environmental impacts associated with authorizing the construction, operation, and decommissioning of an advanced nuclear reactor. Table C–1 summarizes the Commission's generic findings on the scope and magnitude of environmental impacts of such an authorization as required by section 102(2) of the National Environmental Policy Act of 1969, as amended. Table C-1 presents the results of the generic analysis of those environmental impacts associated with building,[1] operating, and decommissioning an advanced nuclear reactor that the staff has designated Category 1, as well as listing the issues that could not be resolved generically, designated as Category 2. The use of this table by applicants will be in accordance with § 51.50(d), and the use by the staff will be in accordance with §§ 51.75(d) and 51.96.

[1]The term "building," as used in the ANR GEIS, includes the full range of preconstruction (building activities not within the NRC's regulatory authority), and construction and installation activities (building activities within the NRC's regulatory authority).

Table C–1 to Appendix C.—Summary of Findings on NEPA Issues for Permitting and Licensing of Advanced Nuclear Reactors[1]

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Land Use			
Construction			

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Onsite Land Use	1	SMALL	The proposed project, including any associated land uses, complies with applicable NRC siting regulations such as 10 CFR part 100. The site size is 100 ac (40.5 ha) or less. The permanent footprint of disturbance includes 30 ac (12 ha) or less of vegetated lands, and the temporary footprint of disturbance includes no more than an additional 20 ac (8.1 ha) or less of vegetated lands. The proposed project complies with the site's zoning and is consistent with any relevant land use plans or comprehensive plans. The site would not be situated closer than 0.5 mi (0.8 km) to existing residential areas or 1.0 mi (1.6 km) to sensitive land uses such as Federal, State, or local parks; wildlife refuges; conservation lands; Wild and Scenic Rivers; or Natural Heritage Rivers. The site does not have a history of past industrial use capable of leaving a legacy of contamination requiring cleanup to protect human health and the environment. The total wetland loss from use of the site, including use of any offsite rights-of-way (ROWs), would be no more than 0.5 ac (0.2 ha). Best management practices (BMPs) for erosion, sediment control, and stormwater management would be used. Compliance with any mitigation measures established through zoning ordinances, local building permits, site use permits, or other land use authorizations.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Offsite Land Use	1	SMALL	New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. No new offsite ROW would be situated closer than 0.5 mi (0.8 km) to existing residential areas or sensitive land uses such as Federal, State, or local parks; wildlife refuges; conservation lands; Wild and Scenic Rivers; or Natural Heritage Rivers. No existing ROWs in residential areas would be used or widened to accommodate project features. No ROW has a history of past industrial use capable of leaving a legacy of contamination requiring cleanup to protect human health and the environment. The total wetland loss from use of the entire project, including use of the site and any offsite ROWs, would be no more than 0.5 ac (0.2 ha). BMPs for erosion, sediment control, and stormwater management would be used. Compliance with any mitigation measures established through zoning ordinances, local building permits, site use permits, or other land use authorizations.
Impacts to Prime and Unique Farmland	1	SMALL	The site size is 100 ac (40.5 ha) or less. The site does not contain any prime or unique farmland or other farmland of statewide or local importance; or the site does not abut any agricultural land and is not situated in a predominantly agricultural landscape.
Coastal Zone and Compliance with the Coastal Zone Management Act (16 U.S.C. §§ 1451 et seq.)	1	SMALL	The site is not situated in any designated coastal zone, or the applicant can demonstrate that the affected state(s) have or will issue a consistency determination or other indication that the project complies with the Coastal Zone Management Act.
Operation			
Onsite Land Use	1	SMALL	The proposed project, including any associated land uses, complies with applicable NRC siting regulations such as 10 CFR part 100. The site size is 100 ac (40.5 ha) or less. If needed, cooling towers would be mechanical draft, not natural draft; less than 100 ft (30.5 m) in height; and equipped with drift eliminators.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Any makeup water for the cooling towers would be fresh water (less than 1 ppt salinity). BMPs for erosion, sediment control, and stormwater management would be used.
Offsite Land Use	1	SMALL	New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. BMPs for erosion, sediment control, and stormwater management would be used (wherever land is disturbed during the course of ROW management).
Visual Resources			
Construction			
Visual Impacts in Site and Vicinity	1	SMALL	The site size is 100 ac (40.5 ha) or less. The site would not be situated closer than 0.5 mi (0.8 km) to existing residential areas or 1 mi (1.6 km) to sensitive land uses such as Federal, State, or local parks; wildlife refuges; conservation lands; Wild and Scenic Rivers; or Natural Heritage Rivers. The maximum proposed building and structure height is no more than 50 ft (15.2 m), except that the maximum height is 200 ft (61 m) for proposed meteorological towers and 100 ft (30.5 m) for transmission line poles/towers and mechanical draft cooling towers. The proposed project structures would not be visible from Federal or State parks or wilderness areas designated as Class 1 under Section 162 of the Clean Air Act (42 U.S.C. § 7472); or as a Wild and Scenic River, a Natural Heritage River, or a river of similar State designation.
Visual Impacts from Transmission Lines	1	SMALL	New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. No transmission line structures (poles or towers) would be over 100 ft (30.5 m) in height. The new offsite ROWs would not be situated closer than 1 mi (1.6 km) to existing residential areas or sensitive land uses such as Federal, State, or local parks; wildlife refuges; conservation lands; Wild and Scenic Rivers; or Natural Heritage Rivers. Any proposed new structures on offsite ROWs would not be visible from Federal or State parks or

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			wilderness areas designated as Class 1 under Section 162 of the Clean Air Act (42 U.S.C. § 7472); or as a Wild and Scenic River, a Natural Heritage River, or a river of similar State designation.
Operation			
Visual Impacts During Operations	1	SMALL	The site would not be situated closer than 1 mi (1.6 km) to existing residential areas or sensitive land uses such as Federal, State, or local parks; wildlife refuges; conservation lands; Wild and Scenic Rivers; or Natural Heritage Rivers. The maximum proposed building and structure height would be no more than 50 ft (15.2 m), except that the maximum height would be 200 ft (61 m) for proposed meteorological towers and 100 ft (30.5 m) for proposed transmission line poles/towers and proposed mechanical draft cooling towers. The proposed project structures would not be visible from Federal or State parks or wilderness areas designated as Class 1 under Section 162 of the Clean Air Act (42 U.S.C. § 7472); or as a Wild and Scenic River, a Natural Heritage River, or a river of similar State designation. If needed, cooling towers would be mechanical draft, not natural draft; less than 100 ft (30.5 m) in height; and equipped with drift eliminators. Any makeup water for the cooling towers would be fresh water (less than 1 ppt salinity).
Meteorology and Air Quality			
Construction			
Emissions of Criteria Pollutants and Dust During Construction	1	SMALL	The site size is 100 ac (40.5 ha) or less. The permanent footprint of disturbance is 30 ac (12 ha) or less of vegetated lands and the temporary footprint of disturbance is an additional 20 ac (8.1 ha) or less of vegetated land. New offsite ROWs for transmission lines, pipelines, or access roads would be no longer than 1 mi (1.6 km) and have a maximum ROW width of 100 ft (30.5 m). Criteria pollutants emitted from vehicles and standby power equipment during construction are less than Clean Air Act de minimis levels set by the U.S. Environmental Protection Agency (EPA) if the site is located in a nonattainment or maintenance area, or the site is located in an attainment area.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			The site is not located within 1 mi (1.6 km) of a mandatory Class I Federal area where visibility is an important value. The level of service (LOS) determination for affected roadways does not change. Mitigation necessary to rely on the generic analysis includes implementation of BMPs for dust control. Compliance with air permits under State and Federal laws that address the impact of air emissions during construction.
Greenhouse Gas Emissions During Construction	1	SMALL	Greenhouse gases emitted by equipment and vehicles during the 97-year advanced nuclear reactor greenhouse gas life-cycle period would be equal to or less than 2,534,000 metric tons (MT) of carbon dioxide equivalent (CO_2(e)). Appendix H of NUREG-2249, "Generic Environmental Impact Statement for Advanced Nuclear Reactors" contains the staff's methodology for developing this value, which includes emissions from construction, operation, and decommissioning. As long as this total value is met, the impacts for the life-cycle of the project and the individual phases of the project are determined to be SMALL.
Operation			
Emissions of Criteria and Hazardous Air Pollutants during Operation	1	SMALL	Criteria pollutants emitted from vehicles and standby power equipment during operations are less than Clean Air Act de minimis levels set by the EPA if located in a nonattainment or maintenance area. The site is not located within 1 mi (1.6 km) of a mandatory Class I Federal area where visibility is an important value. The LOS determination for affected roadways does not change. The generic analysis can be relied on without applying any mitigation measures. Compliance with air permits under State and Federal laws that address the impact of air emissions. Hazardous air pollutant (HAP) emissions will be within regulatory limits.
Greenhouse Gas Emissions During Operation	1	SMALL	Greenhouse gases emitted by equipment and vehicles during the 97-year advanced nuclear reactor greenhouse gas life-cycle period would be equal to or less than 2,534,000 MT of CO_2(e).

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Appendix H of NUREG-2249, "Generic Environmental Impact Statement for Advanced Nuclear Reactors" contains the staff's methodology for developing this value, which includes emissions from construction, operation, and decommissioning. As long as this total value is met, the impacts for the life-cycle of the project and the individual phases of the project are determined to be SMALL.
Cooling-System Emissions	1	SMALL	If needed, cooling towers would be mechanical draft, not natural draft. Cooling towers would be equipped with drift eliminators. The site is not located within 1 mi (1.6 km) of a mandatory Class I Federal area where visibility is an important value. Mechanical draft cooling towers would be less than 100 ft (30.5 m) tall. Makeup water would be fresh (with a salinity less than 1 ppt). Operation of cooling towers is assumed to be subject to State permitting requirements. HAP emissions would be within regulatory limits. No existing residential areas within 0.5 mi (0.8 km) of the site.
Emissions of Ozone and Nitrogen Oxides during Transmission Line Operation	1	SMALL	The transmission line voltage would be no higher than 1,200 kV.
Water Resources			
Construction			
Surface Water Use Conflicts during Construction	1	SMALL	Total Plant Water Demand Less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). If water is obtained from a flowing water body, then the following plant parameter envelope/site parameter envelope (PPE/SPE) parameter and associated assumptions also apply: Average plant water withdrawals do not reduce discharge from the flowing water body by more than 3 percent of the 95 percent exceedance daily flow and do not prevent the maintenance of applicable instream flow requirements.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			The 95 percent exceedance flow accounts for existing and planned future withdrawals. Water availability is demonstrated by the ability to obtain a withdrawal permit issued by State, regional, or tribal governing authorities. Water rights for the withdrawal amount are obtainable, if needed. If water is obtained from a non-flowing water body, then the following PPE/SPE parameter and associated value and assumptions also apply: Water availability of the Great Lakes, the Gulf of Mexico, oceans, estuaries, and intertidal zones exceeds the amount of water required by the plant. Water availability is demonstrated by the ability to obtain a withdrawal permit issued by State, regional, or tribal governing authorities. Water rights for the withdrawal amount are obtainable, if needed. The Coastal Zone Management Act consistency determination is obtainable, if applicable, for the non-flowing water body.
Groundwater Use Conflicts due to Excavation Dewatering	1	SMALL	The long-term dewatering withdrawal rate is less than or equal to 50 gpm (0.003 m^3/s) (the initial rate may be larger). Dewatering results in negligible groundwater level drawdown at the site boundary.
Groundwater Use Conflicts due to Construction-Related Groundwater Withdrawals	1	SMALL	Groundwater withdrawal for all plant uses (excluding dewatering) is less than or equal to 50 gpm (0.003 m^3/s). Withdrawal results in no more than 1 ft (0.3 m) of groundwater level drawdown at the site boundary. Withdrawals are not derived from an EPA-designated Sole Source Aquifer (SSA), or from any aquifer designated by a State, tribe, or regional authority to have special protections to limit drawdown. Withdrawals meet any applicable State or local permit requirements.
Water Quality Degradation due to Construction-Related Discharges	1	SMALL	The permanent footprint of disturbance includes 30 ac (12 ha) or less of vegetated lands, and the temporary footprint of disturbance includes no more than an additional 20 ac (8.1 ha) or less of vegetated lands.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Adherence to requirements in National Pollutant Discharge Elimination System (NPDES) permits issued by the EPA or State permitting program, and any other applicable permits. The long-term groundwater dewatering withdrawal rate is less than or equal to 50 gpm (0.003 m^3/s). Dewatering discharge has minimal effects on the quality of the receiving water body (e.g., as demonstrated by conformance with NPDES permit requirements). There are no planned discharges to the subsurface (by infiltration or injection), including stormwater discharge.
Water Quality Degradation due to Inadvertent Spills during Construction	1	SMALL	The site size is 100 ac (40.5 ha) or less. The permanent footprint of disturbance includes 30 ac (12 ha) or less of vegetated lands, and the temporary footprint of disturbance includes no more than an additional 20 ac (8.1 ha) or less of vegetated lands. Applicable requirements and guidance on spill prevention and control are followed, including relevant BMPs and Integrated Pollution Prevention Plans (IPPPs).
Water Quality Degradation due to Groundwater Withdrawal	1	SMALL	Groundwater Withdrawal for Excavation or Foundation Dewatering The long-term dewatering withdrawal rate is less than or equal to 50 gpm (0.003 m^3/s) (the initial rate may be larger). Dewatering results in negligible groundwater level drawdown at the site boundary. Groundwater Withdrawal for Plant Uses Groundwater withdrawal for all plant uses (excluding dewatering) is less than or equal to 50 gpm (0.003 m^3/s). Withdrawal results in no more than 1 ft (0.3 m) of groundwater level drawdown at the site boundary. Withdrawals are not derived from an EPA-designated SSA, or from any aquifer designated by a State, tribe, or regional authority to have special protections to limit drawdown. Withdrawals meet any applicable State or local permit requirements.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Water Quality Degradation due to Offshore or In-Water Construction Activities	1	SMALL	In-water structures (including intake and discharge structures) are constructed in compliance with provisions of the Clean Water Act (CWA) Section 404 (33 U.S.C. § 1344) and Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 U.S.C. §§ 401 et seq.). Adverse effects of building activities controlled and localized using BMPs such as installation of turbidity curtains or installation of cofferdams. Construction duration would be less than 7 years.
Water Use Conflict Due to Plant Municipal Water Demand	1	SMALL	The amount available from municipal water systems exceeds the amount of municipal water required by the plant (gpm). Municipal Water Availability accounts for all existing and planned future uses. An agreement or permit for the usage amount can be obtained from the municipality.
Degradation of Water Quality from Plant Effluent Discharges to Municipal Systems	1	SMALL	Municipal Systems' Available Capacity to Receive and Treat Plant Effluent accounts for all existing and reasonably foreseeable future discharges. Agreement to discharge to a municipal treatment system is obtainable.
Operation			
Surface Water Use Conflicts during Operation due to Water Withdrawal from Flowing Waterbodies	1	SMALL	Total plant water demand is less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). Average plant water withdrawals do not reduce discharge from the flowing water body by more than 3 percent of the 95 percent exceedance daily flow and do not prevent the maintenance of applicable instream flow requirements. The 95 percent exceedance flow accounts for existing and planned future withdrawals. Water availability is demonstrated by the ability to obtain a withdrawal permit issued by State, regional, or tribal governing authorities. Water rights for the withdrawal amount are obtainable, if needed.
Surface Water Use Conflicts during Operation due to Water Withdrawal from Non-flowing Waterbodies	1	SMALL	Total plant water demand is less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). Water availability of the Great Lakes, the Gulf of Mexico, oceans, estuaries, and intertidal zones exceeds the amount of water required by the plant. Water availability is demonstrated by the ability to obtain a withdrawal permit issued by State, regional, or tribal governing authorities.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Water rights for the withdrawal amount are obtainable, if needed. Coastal Zone Management Act of 1972 (16 U.S.C. §§ 1451 et seq.) consistency determination is obtainable, if applicable.
Groundwater Use Conflicts Due to Building Foundation Dewatering	1	SMALL	The long-term dewatering withdrawal rate is less than or equal to 50 gpm (0.003 m^3/s) (the initial rate may be larger). Dewatering results in negligible groundwater level drawdown at the site boundary.
Groundwater Use Conflicts Due to Groundwater Withdrawals for Plant Uses	1	SMALL	Groundwater withdrawal for all plant uses (excluding dewatering) is less than or equal to 50 gpm (0.003 m^3/s). Withdrawal results in no more than 1 ft (0.3 m) of groundwater level drawdown at the site boundary. Withdrawals are not derived from an EPA-designated SSA, or from any aquifer designated by a State, tribe, or regional authority to have special protections to limit drawdown. Withdrawals meet any applicable State or local permit requirements.
Surface Water Quality Degradation Due to Physical Effects from Operation of Intake and Discharge Structures	1	SMALL	Total plant water demand is less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). Adhere to best available technology requirements of CWA 316(b) (33 U.S.C. § 1326). Operated in compliance with CWA Section 316 (b) and 40 CFR 125.83, including compliance with monitoring and recordkeeping requirements in 40 CFR 125.87 and 40 CFR 125.88, respectively (40 CFR part 125). Best available technologies are employed in the design and operation of intake and discharge structures to minimize alterations due to scouring, sediment transport, increased turbidity, and erosion. Adherence to requirements in NPDES permits issued by the EPA or a given state. If water is obtained from a flowing water body, then the following PPE/SPE parameter and associated value also apply: The average rate of plant withdrawal does not exceed 3 percent of the 95 percent exceedance daily flow for the water body.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			If water is obtained from a non-flowing water body, then the following PPE/SPE parameters and associated values and assumptions also apply: Water availability of the Great Lakes, the Gulf of Mexico, oceans, estuaries, and intertidal zones exceeds the amount of water required by the plant.
Surface Water Quality Degradation Due to Changes in Salinity Gradients Resulting from Withdrawals	1	SMALL	Total plant water demand is less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). If water is obtained from a flowing water body, then the following PPE/SPE parameter and associated assumptions also apply: Average plant water withdrawals do not reduce discharge from the flowing water body by more than 3 percent of the 95 percent exceedance daily flow and do not prevent the maintenance of applicable instream flow requirements. The 95 percent exceedance flow accounts for existing and planned future withdrawals. Water availability is demonstrated by the ability to obtain a withdrawal permit issued by State, regional, or tribal governing authorities. Water rights for the withdrawal amount are obtainable, if needed. If withdrawals are from an estuary or intertidal zone, then changes to salinity gradients are within the normal tidal or seasonal movements that characterize the water body. If water is obtained from a non-flowing water body, then the following PPE/SPE parameter and associated values and assumptions also apply: Water availability of the Great Lakes, the Gulf of Mexico, oceans, estuaries, and intertidal zones exceeds the amount of water required by the plant. Water availability is demonstrated by the ability to obtain a withdrawal permit issued by State, regional, or tribal governing authorities. Water rights for the withdrawal amount are obtainable, if needed. If withdrawals are from an estuary or intertidal zone, then changes to salinity gradients are within the normal tidal or seasonal movements that characterize the water body.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Surface Water Quality Degradation Due to Chemical and Thermal Discharges	2	Undetermined	The staff determined that a generic analysis to determine operational impacts on surface water quality due to chemical and thermal discharges was not possible because (1) some States may impose effluent constituent limitations more stringent that those required by the EPA, (2) limitations imposed on effluent constituents may vary among States, and (3) the establishment of a mixing zone may be required. Because all of these issues related to degradation of surface water quality from chemical and thermal discharges require consideration of project-specific information, a project-specific assessment should be performed in the supplemental environmental impact statement.
Groundwater Quality Degradation Due to Plant Discharges	1	SMALL	The plant is outside the recharge area for any EPA-designated SSA, or any aquifer designated to have special protections by a State, tribal, or regional authority. The plant is outside the wellhead protection area or designated contributing area for any public water supply well. There are no planned discharges to the subsurface (by infiltration or injection).
Water Quality Degradation due to Inadvertent Spills and Leaks during Operation	1	SMALL	Applicable requirements and guidance on spill prevention and control are followed, including relevant BMPs and IPPPs. There are no planned discharges to the subsurface (by infiltration or injection), including stormwater discharge. A groundwater protection program conforming to currently applicable industry guidance is established and followed. The site size is 100 ac (40.5 ha) or less. Use of BMPs for soil erosion, sediment control, and stormwater management. Adherence to requirements in NPDES permits issued by the EPA or a given State, and any other applicable permits.
Water Quality Degradation due to Groundwater Withdrawals	1	SMALL	The long-term dewatering withdrawal rate is less than or equal to 50 gpm (0.003 m^3/s) (the initial rate may be larger). Dewatering results in negligible groundwater level drawdown at the site boundary.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Groundwater withdrawal for all plant uses (excluding dewatering) is less than or equal to 50 gpm (0.003 m^3/s). Withdrawal results in no more than 1 ft (0.3 m) of groundwater level drawdown at the site boundary. Withdrawals are not derived from an EPA-designated SSA, or from any aquifer designated by a State, tribe, or regional authority to have special protections to limit drawdown. Withdrawals meet any applicable State or local permit requirements.
Water Use Conflict from Plant Municipal Water Demand	1	SMALL	Usage amount is within the existing capacity of the system(s), accounting for all existing and planned future uses. An agreement or permit for the usage amount can be obtained from the municipality.
Degradation of Water Quality from Plant Effluent Discharges to Municipal Systems	1	SMALL	Municipal Systems' Available Capacity to Receive and Treat Plant Effluent accounts for all existing and reasonably foreseeable future discharges. Agreement to discharge to a municipal treatment system is obtainable.
Terrestrial Ecology			
Construction			
Permanent and Temporary Loss, Conversion, Fragmentation, and Degradation of Habitats	1	SMALL	The permanent footprint of disturbance would include 30 ac (12 ha) or less of vegetated lands, and the temporary footprint of disturbance would include no more than an additional 20 ac (8.1 ha) or less of vegetated lands. Temporarily disturbed lands would be revegetated using regionally indigenous vegetation once the lands are no longer needed to support building activities. New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. The footprint of disturbance (permanent and temporary) would contain no ecologically sensitive features such as floodplains, shorelines, riparian vegetation, late-successional vegetation, land specifically designated for conservation, or habitat known to be potentially suitable for one or more Federal or State threatened or endangered species.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Total wetland impacts from use of the site and any offsite ROWs would be no more than 0.5 ac (0.2 ha). Applicants would demonstrate an effort to minimize fragmentation of terrestrial habitats by using existing ROWs, or widening existing ROWs, to the extent practicable. BMPs would be used for erosion, sediment control, and stormwater management.
Permanent and Temporary Loss and Degradation of Wetlands	1	SMALL	Applicant would provide a delineation of potentially impacted wetlands, including wetlands not under CWA jurisdiction. Total wetland impacts from use of the site and any offsite ROWs would be no more than 0.5 ac (0.2 ha). If activities regulated under the CWA are performed, those activities would receive approval under one or more nationwide permits (NWPs) (33 CFR part 330) or other general permits recognized by the U.S. Army Corps of Engineers. Temporary groundwater withdrawals for excavation or foundation dewatering would not exceed a long-term rate of 50 gpm (0.003 m^3/s). Applicants would be able to demonstrate that the temporary groundwater withdrawals would not substantially alter the hydrology of wetlands connected to the same groundwater resource. Any required state or local permits for wetland impacts would be obtained. Any mitigation measures indicated in the NWPs or other permits would be implemented. BMPs would be used for erosion, sediment control, and stormwater management.
Effects of Building Noise on Wildlife	1	SMALL	Noise generation would not exceed 85 dBA 50 ft (15.2 m) from the source.
Effects of Vehicular Collisions on Wildlife	1	SMALL	The site size would be 100 ac (40.5 ha) or less. The permanent footprint of disturbance would include 30 ac (12 ha) or less of vegetated lands, and the temporary footprint of disturbance would include no more than an additional 20 ac (8.1 ha) or less of vegetated lands. There would be no decreases in the LOS designation for affected roadways. The licensee would communicate with Federal and State wildlife agencies and implement mitigation

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			actions recommended by those agencies to reduce potential for vehicular injury to wildlife.
Bird Collisions and Injury from Structures and Transmission Lines	1	SMALL	The site size would be 100 ac (40.5 ha) or less. New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. No transmission line structures (poles or towers) would be more than 100 ft (30.5 m) in height. Licensees would implement common mitigation measures.
Important Species and Habitats – Resources Regulated under the Endangered Species Act of 1973 (ESA; 16 U.S.C. §§ 1531 et seq.)	2	Undetermined	The NRC staff is unable to determine the significance of potential impacts without consideration of project-specific factors, including the specific species and habitats affected and the types of ecological changes potentially resulting from each specific licensing action.
Important Species and Habitats – Other Important Species and Habitats	1	SMALL	Applicants would communicate with State natural resource or conservation agencies regarding wildlife and plants and implement mitigation recommendations of those agencies.
Operation			
Permanent and Temporary Loss or Disturbance of Habitats	1	SMALL	Temporarily disturbed lands would be revegetated using regionally indigenous vegetation once the lands are no longer needed to support building activities. The total wetland loss from site disturbance over the operational life of the plant would be no more than 0.5 ac (0.2 ha). Any State or local permits for wetland impacts would be obtained. Any mitigation measures indicated in the NWPs or other wetland permits would be implemented. BMPs would be used for erosion, sediment control, and stormwater management.
Effects of Operational Noise on Wildlife	1	SMALL	Noise generation would not exceed 85 dBA 50 ft (15.2 m) from the source. There would be no decreases in the LOS designation for affected roadways.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			The licensee would communicate with Federal and State wildlife agencies and implement mitigation actions recommended by those agencies to reduce potential for vehicular injury to wildlife.
Effects of Vehicular Collisions on Wildlife	1	SMALL	Noise generation would not exceed 85 dBA 50 ft (15.2 m) from the source. There would be no decreases in the LOS designation for affected roadways. The licensee would communicate with Federal and State wildlife agencies and implement mitigation actions recommended by those agencies to reduce potential for vehicular injury to wildlife.
Exposure of Terrestrial Organisms to Radionuclides	1	SMALL	Applicants would demonstrate in their application that any radiological nonhuman biota doses would be below applicable guidelines.
Cooling-Tower Operational Impacts on Vegetation	1	SMALL	If needed, cooling towers would be mechanical draft, not natural draft; less than 100 ft (30.5 m) in height; and equipped with drift eliminators. Any makeup water for the cooling towers would be fresh water (less than 1 ppt salinity).
Bird Collisions and Injury from Structures and Transmission Lines	1	SMALL	The site size would be 100 ac (40.5 ha) or less. New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. No transmission line structures (poles or towers) would be more than 100 ft (30.5 m) in height. Licensees would implement common mitigation measures.
Bird Electrocutions from Transmission Lines	1	SMALL	New offsite ROWs for transmission lines, pipelines, or access roads would be no more than 100 ft (30.5 m) in width and total no more than 1 mi (1.6 km) in length. Common mitigation measures would be implemented.
Water Use Conflicts with Terrestrial Resources	1	SMALL	Total plant water demand would be less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). If water is withdrawn from flowing water bodies, average plant water withdrawals would not reduce flow by more than 3 percent of the 95 percent exceedance daily flow and would not prevent maintenance of applicable instream flow requirements.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Any water withdrawals would be in compliance with any EPA or State permitting requirements. Applicants would be able to demonstrate that hydroperiod changes are within historical or seasonal fluctuations.
Effects of Transmission Line ROW Management on Terrestrial Resources	1	SMALL	Vegetation in transmission line ROWs would be managed following a plan consisting of integrated vegetation management practices. All ROW maintenance work would be performed in compliance with all applicable laws and regulations. Herbicides would be applied by licensed applicators, and only if in compliance with applicable manufacturer label instructions.
Effects of Electromagnetic Fields on Flora and Fauna	1	SMALL	Based on the literature review in the License Renewal Generic Environmental Impact Statement (GEIS), the staff determined that this is a Category 1 issue and impacts would be SMALL regardless of the length, location, or size of the transmission lines. The staff did not recommend any mitigation in the License Renewal GEIS; hence, none is needed here. The staff did not rely on any PPE and SPE values or assumptions in reaching this conclusion.
Important Species and Habitats – Resources Regulated under the ESA of 1973	2	Undetermined	The NRC staff is unable to determine the significance of potential impacts without consideration of project-specific factors, including the specific species and habitats affected and the types of ecological changes potentially resulting from each specific licensing action.
Important Species and Habitats – Other Important Species and Habitats	1	SMALL	Applicants would communicate with State natural resource or conservation agencies regarding wildlife and plants and implement mitigation recommendations of those agencies.
Aquatic Ecology			
Construction			
Runoff and sedimentation from construction areas	1	SMALL	BMPs would be used for erosion and sediment control. Temporarily disturbed lands would be revegetated using regionally indigenous vegetation once the lands are no longer needed to support building activities.
Dredging and filling aquatic habitats to build	1	SMALL	Applicant would obtain approval, if required, under NWP 7 in 33 CFR part 330.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
intake and discharge structures			Applicant would implement any mitigation required under NWP 7 in 33 CFR part 330. Applicant would minimize any temporarily disturbed shoreline and riparian lands needed to build the intake and discharge structures and restore those areas with regionally indigenous vegetation suited to those landscape settings once the disturbances are no longer needed. BMPs would be used for erosion and sediment control.
Building transmission lines, pipelines, and access roads across surface waterbodies	1	SMALL	If activities regulated under the CWA are performed, they would receive approval under one or more NWPs (33 CFR part 330) or other general permits recognized by the U.S. Army Corps of Engineers. Pipelines would be extended under (or over) surface through directional drilling without physically disturbing shorelines or bottom substrate. Access roads would span streams and other surface waterbodies with a bridge or ford, and any fords would include placement and maintenance of matting to minimize physical disturbance of shorelines and bottom substrates. No access roads would be extended across stream channels over 10 ft (3 m) in width (at ordinary high water). Any bridges or fords would be removed once no longer needed, and any exposed soils or substrate would be revegetated using regionally indigenous vegetation appropriate to the landscape setting. Any mitigation measures indicated in the NWPs or other permits would be implemented. BMPs would be used for erosion and sediment control.
Important Species and Habitats – Resources Regulated under the ESA and Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.)	2	Undetermined	The NRC staff is unable to determine the significance of potential impacts without consideration of project-specific factors, including the specific species and habitats affected and the types of ecological changes potentially resulting from each specific licensing action. Furthermore, the Endangered Species Act (16 U.S.C. §§ 1531 et seq.) and Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.) require consultations for each licensing action that may affect regulated resources.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Important species and habitats – Other Important Species and Habitats	1	SMALL	Applicants would communicate with State natural resource or conservation agencies regarding aquatic fish, wildlife, and plants and implement mitigation recommendation of those agencies.
Operation			
Stormwater runoff	1	SMALL	Preparation, approval by applicable regulatory agencies, and implementation of a stormwater management plan. Obtaining and compliance with any required permits for the storage and use of hazardous materials issued by Federal and State agencies under Resource Conservation and Recovery Act (RCRA). BMPs would be used for stormwater management.
Exposure of aquatic organisms to radionuclides	1	SMALL	Applicants would demonstrate in their application that any radiological nonhuman biota doses would be below applicable guidelines.
Effects of refurbishment on aquatic biota	1	SMALL	BMPs would be used for erosion, sediment control, and stormwater management. Exposed soils would be restored as soon as possible with regionally indigenous vegetation.
Effects of maintenance dredging on aquatic biota	1	SMALL	If activities regulated under the CWA are performed, those activities would receive approval under one or more NWPs (33 CFR part 330) or other general permits recognized by the U.S. Army Corps of Engineers. Any mitigation measures indicated in the NWPs or other permits would be implemented. BMPs would be used for erosion and sediment control.
Impacts of transmission line ROW management on aquatic resources	1	SMALL	Vegetation in transmission line ROWs would be managed following a plan consisting of integrated vegetation management practices. All ROW maintenance work would be performed in compliance with all applicable laws and regulations. Herbicides would be applied by licensed applicators, and only if in compliance with applicable manufacturer label instructions. BMPs would be used for erosion and sediment control.
Impingement and entrainment of aquatic organisms	1	SMALL	Intakes would comply with regulatory requirements established by EPA in 40 CFR 125.84 to be protective of fish and shellfish.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Best available control technology would be employed in the design of intakes to minimize entrainment and impingement, such as use of screens and intake rates recognized to minimize effects.
Thermal impacts on aquatic biota	2	Undetermined	Staff would have to first review the discharge plume analysis (as described in Section 3.4) and the aquatic biota potentially present before being able to reach a conclusion regarding the possible significance of impacts to that biota.
Other effects of cooling-water discharges on aquatic biota	2	Undetermined	Staff would have to first review the discharge plume analysis (as described in Section 3.4) and the aquatic biota potentially present before being able to reach a conclusion regarding the possible significance of impacts to that biota.
Water use conflicts with aquatic resources	1	SMALL	If needed, cooling towers would be mechanical draft, not natural draft; less than 100 ft (30.5 m) in height; and equipped with drift eliminators. Any makeup water for the cooling towers would be fresh water (less than 1 ppt salinity). Total plant water demand would be less than or equal to a daily average of 6,000 gpm (0.379 m^3/s). If water is withdrawn from flowing waterbodies, average plant water withdrawals would not reduce flow by more than 3 percent of the 95 percent exceedance daily flow and would not prevent maintenance of applicable instream flow requirements. Any water withdrawals would be in compliance with any EPA or State permitting requirements. Applicants would be able to demonstrate that hydroperiod changes are within historical or seasonal fluctuations.
Important Species and Habitats – Resources Regulated under the ESA and Magnuson-Stevens Fishery Conservation and Management Act	2	Undetermined	The NRC staff is unable to determine the significance of potential impacts without consideration of project-specific factors, including the specific species and habitats affected and the types of ecological changes potentially resulting from each specific licensing action. Furthermore, the Endangered Species Act (16 U.S.C. §§ 1531 et seq.) and Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.) require consultations for each licensing action that may affect regulated resources.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Important species and habitats – Other Important Species and Habitats	1	SMALL	Applicants would communicate with State natural resource or conservation agencies regarding aquatic fish, wildlife, and plants and implement mitigation recommendations of those agencies.
Historic and Cultural Resources			
Construction			
Construction impacts on historic and cultural resources	2	Undetermined	Impacts on historic and cultural resources are analyzed on a project-specific basis. The NRC will perform National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) Section 106 analysis, in accordance with 36 CFR part 800, in its preparation of the supplemental environmental impact statement. The NHPA Section 106 analysis includes consultation with the State and Tribal Historic Preservation Officers, American Indian Tribes, and other interested parties.
Operation			
Operation impacts on historic and cultural resources	2	Undetermined	Impacts on historic and cultural resources are analyzed on a project-specific basis. The NRC will perform NEPA and NHPA Section 106 analysis, in accordance with 36 CFR part 800, in its preparation of the supplemental environmental impact statement. The NHPA Section 106 analysis includes consultation with the State and Tribal Historic Preservation Officers, American Indian Tribes, and other interested parties.
Environmental Hazards - Radiological Environment			
Construction			
Radiological dose to construction workers	1	SMALL	For protection against radiation, the applicant must meet the regulatory requirements of: 10 CFR 20.1101 Radiation Protection Programs if issued a license 10 CFR 20.1201 Occupational dose limits for adults 10 CFR 20.1301 Dose limits for individual members of the public Appendix B to 10 CFR part 20 Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage Applicable NRC radiation protection regulations, such as:

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			10 CFR 50.34a Design objectives for equipment to control releases of radioactive material in effluents—nuclear power reactors 10 CFR 50.36a Technical specifications on effluents from nuclear power reactors Application contains sufficient technical information for the staff to complete the detailed technical safety review. Application will be found to be in compliance by the staff with the above regulations through a radiation protection program and an effluent release monitoring program.
Operation			
Occupational doses to workers	1	SMALL	For protection against radiation, the applicant must meet the regulatory requirements of: 10 CFR 20.1101 Radiation Protection Programs if issued a license 10 CFR 20.1201 Occupational dose limits for adults Appendix B to 10 CFR part 20 Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage Applicable radiation protection regulations, such as: 10 CFR 50.34 a Design objectives for equipment to control releases of radioactive material in effluents—nuclear power reactors 10 CFR 50.36 a Technical specifications on effluents from nuclear power reactors Application contains sufficient technical information for the staff to complete the detailed technical safety review Application will be found to be in compliance by the staff with the above regulations through a radiation protection program and an effluent release monitoring program.
Maximally exposed individual annual doses	1	SMALL	For protection against radiation, the applicant must meet the regulatory requirements of: 10 CFR 20.1101 Radiation Protection Programs if issued a license 10 CFR 20.1301 Dose limits for individual members of the public Appendix B to 10 CFR part 20 Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Exposure; Effluent Concentrations; Concentrations for Release to Sewerage Applicable radiation protection regulations, such as: 10 CFR 50.34a Design objectives for equipment to control releases of radioactive material in effluents—nuclear power reactors 10 CFR 50.36a Technical specifications on effluents from nuclear power reactors Application contains sufficient technical information for the staff to complete the detailed technical safety review Application will be found to be in compliance by the staff with the above regulations through a radiation protection program and an effluent release monitoring program
Total population annual doses	1	SMALL	For protection against radiation, the applicant must meet the regulatory requirements of: 10 CFR 20.1101 Radiation Protection Programs if issued a license 10 CFR 20.1301 Dose limits for individual members of the public Appendix B of 10 CFR part 20 Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage Applicable radiation protection regulations, such as: 10 CFR 50.34a Design objectives for equipment to control releases of radioactive material in effluents—nuclear power reactors 10 CFR 50.36a Technical specifications on effluents from nuclear power reactors Application contains sufficient technical information for the staff to complete the detailed technical safety review Application will be found to be in compliance by the staff with the above regulations through a radiation protection program and an effluent release monitoring program.
Nonhuman biota doses	1	SMALL	Applicants would demonstrate in their application that any radiological nonhuman biota doses would be below applicable guidelines.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Environmental Hazards - Nonradiological Environment			
Construction			
Building impacts of chemical, biological, and physical nonradiological hazards	1	SMALL	The applicant must adhere to all applicable Federal, State, local or Tribal regulatory limits and permit conditions for chemical hazards, biological hazards, and physical hazards. The applicant will follow nonradiological public and occupational health BMPs and mitigation measures, as appropriate.
Building impacts of electromagnetic fields (EMFs)	N/A	Uncertain	Studies of 60 Hz EMFs have not uncovered consistent evidence linking harmful effects with field exposures. Because the state of the science is currently inadequate, no generic conclusion on human health impacts is possible. If, in the future, the Commission finds that a general agreement has been reached by appropriate Federal health agencies that there are adverse health effects from EMFs, the Commission will require applicants to submit plant-specific reviews of these health effects as part of their application. Until such time, applicants are not required to submit information about this issue.
Operation			
Operation impacts of chemical, biological, and physical nonradiological hazards	1	SMALL	The applicant must adhere to all applicable Federal, State, local or Tribal regulatory limits and permit conditions for chemical hazards, biological hazards, and physical hazards. The applicant will follow nonradiological public and occupational health BMPs and mitigation measures, as appropriate.
Operation impacts of EMFs	N/A	Uncertain	Studies of 60 Hz EMFs have not uncovered consistent evidence linking harmful effects with field exposures. Because the state of the science is currently inadequate, no generic conclusion on human health impacts is possible. If, in the future, the Commission finds that a general agreement has been reached by appropriate Federal health agencies that there are adverse health effects from EMFs, the Commission will require applicants to submit plant-specific reviews of these health effects as part of their application. Until such time, applicants are not required to submit information about this issue.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Noise			
Construction			
Construction-related noise	1	SMALL	The noise level would be no more than 65 dBA at site boundary, unless a relevant State or local noise abatement law or ordinance sets a different threshold, which would then be the presumptive threshold for PPE purposes. If an applicant cannot meet the 65 dBA threshold through mitigation, then the applicant must obtain a various or exception with the relevant State or local regulator. The project would implement BMPs, including such as modeling, foliage planting, construction of noise buffers, and the timing of construction and/or operation activities.
Operation			
Operation-related noise	1	SMALL	The noise level would be no more than 65 dBA at site boundary, unless a relevant State or local noise abatement law or ordinance sets a different threshold, which would then be the presumptive threshold for PPE purposes. If an applicant cannot meet the 65 dBA threshold through mitigation, then the applicant must obtain a various or exception with the relevant State or local regulator. The project would implement BMPs, including such as modeling, foliage planting, construction of noise buffers, and the timing of construction and/or operation activities.
Waste Management - Radiological Waste Management			
Operation			
Low-level radioactive waste (LLRW)	1	SMALL	Applicants must meet the regulatory requirements of 10 CFR part 20 (e.g., 10 CFR 20.1406 and subpart K), 10 CFR part 61, 10 CFR part 71, and 10 CFR part 72. Quantities of LLRW generated at an advanced nuclear reactor would be less than the quantities of LLRW generated at existing nuclear power plants, which generate an average of 21,200 ft^3 (600 m^3) and 2,000 Ci (7.4 × 1013 Bq) per year for boiling water reactors and half that amount for pressurized water reactors.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Onsite spent nuclear fuel management	1	SMALL	Compliance with 10 CFR part 72
Mixed waste	1	SMALL	Resource Conservation and Recovery Act (RCRA) Small Quantity Generator for Mixed Waste.
Waste Management - Nonradiological Waste Management			
Construction			
Construction nonradiological waste	1	SMALL	The applicant must meet all the applicable permit conditions, regulations, and BMPs related to solid, liquid, and gaseous waste management. For hazardous waste generation, applicants must meet conformity with hazard waste quantity generation levels in accordance with RCRA. For sanitary waste, applicants must dispose of sanitary waste in a permitted process. For mitigation measures, the applicant would perform mitigation measures to the extent practicable, such as recycling, process improvements, or the use of a less hazardous substance.
Operation			
Operation nonradiological waste	1	SMALL	The applicant must meet all the applicable permit conditions, regulations, and BMPs related to solid, liquid, and gaseous waste management. For hazardous waste generation, applicants must meet conformity with hazard waste quantity generation levels in accordance with RCRA. For sanitary waste, applicants must dispose of sanitary waste in a permitted process. For mitigation measures, the applicant would perform mitigation measures to the extent practicable, such as recycling, process improvements, or the use of a less hazardous substance.
Postulated Accidents			
Operation			
Design Basis Accidents Involving Radiological Releases	1	SMALL	For the exclusion area boundary, the maximum total effective dose equivalent for any 2-hour period during the radioactivity release should be calculated. For the low-population zone, the total effective dose equivalent should be calculated for the duration of the accident release (i.e., 30 days, or other duration as justified).

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			The above calculations should demonstrate that the design basis accident doses satisfy the dose criteria given in regulations related to the application (e.g., 10 CFR 50.34(a)(1), 10 CFR 52.17(a)(1), and 10 CFR 52.79(a)(1)), standard review plans (e.g., standard review plan criteria, Table 1 in standard review plan Section 15.0.3 of NUREG-0800), and Regulatory Guides, (e.g., Regulatory Guide 1.183), as applicable.
Accidents Involving Releases of Hazardous Chemicals	1	SMALL	Advanced nuclear reactor inventory of a regulated substance is less than its Threshold Quantity. Threshold Quantities are found in 40 CFR 68.130, Tables 1, 2, 3, and 4; and advanced nuclear reactor inventory of an extremely hazardous substance is less than its Threshold Planning Quantity. Threshold Planning Quantities are found in 40 CFR part 355, Appendices A and B.
Severe Accidents	2	Undetermined	Based on the analysis in the Final Safety Analysis Report/Preliminary Safety Analysis Report regarding severe accidents, if an advanced nuclear reactor design has severe accident progressions with radiological or hazardous chemical releases, then an environmental risk evaluation must be performed.
Severe Accident Mitigation Design Alternatives	1	SMALL	If a cost-screening analysis determines that the maximum benefit for avoiding an accident is so small that a severe accident mitigation design alternative analysis is not justified based on a minimum cost to design an appropriate severe accident mitigation design alternative.
Acts of Terrorism	1	SMALL	The environmental impacts of acts of terrorism and sabotage only need to be addressed if an advanced nuclear reactor facility is subject to the jurisdiction of the U.S. Court of Appeals for the Ninth Circuit.
Socioeconomics			
Construction			
Community Services and Infrastructure	1	SMALL	The housing vacancy rate in the affected economic region does not change by more than 5 percent, or at least 5 percent of the housing stock remains available after accounting for in-migrating construction workers. Student:teacher ratios in the affected economic region do not exceed locally mandated levels after

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			including the school age children of the in-migrating worker families.
Transportation Systems and Traffic	1	SMALL	The LOS determination for affected roadways does not change. Mitigation measures may include implementation of traffic flow management, management of shift-change timing, and encouragement of ride-sharing and use of public transportation options, such that LOS values can be maintained with the increased volumes.
Economic Impacts	1	Beneficial	The economic impacts of construction and operation of an advanced nuclear reactor are expected to be beneficial; therefore, this is a Category 1 issue. If, during the project-specific environmental review, the NRC staff determines a detailed analysis of economic costs and benefits is needed for analysis of the range of alternatives considered or relevant to mitigation, the staff may require further information from the applicant.
Tax Revenue Impacts	1	Beneficial	The tax revenue impacts of construction and operation of an advanced nuclear reactor are expected to be beneficial; therefore, this is a Category 1 issue. If, during the project-specific environmental review, the NRC staff determines a detailed analysis of tax revenue costs and benefits is needed for analysis of the range of alternatives considered or relevant to mitigation, the staff may require further information from the applicant.
Operation			
Community Services and Infrastructure	1	SMALL	The housing vacancy rate in the affected economic region does not change by more than 5 percent, or at least 5 percent of the housing stock remains available after accounting for in-migrating construction workers. Student:teacher ratios in the affected economic region do not exceed locally mandated levels after including the school age children of the in-migrating worker families.
Transportation Systems and Traffic	1	SMALL	The LOS determination for affected roadways does not change. Mitigation measures may include implementation of traffic flow management, management of shift-change timing, and encouragement of ride-sharing and use of public transportation options, such that LOS values can be maintained with the increased volumes.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Economic Impacts	1	Beneficial	The economic impacts of construction and operation of an advanced nuclear reactor are expected to be beneficial; therefore, this is a Category 1 issue. If, during the project-specific environmental review, the NRC staff determines a detailed analysis of economic costs and benefits is needed for analysis of the range of alternatives considered or relevant to mitigation, the staff may require further information from the applicant.
Tax Revenue Impacts	1	Beneficial	The tax revenue impacts of construction and operation of an advanced nuclear reactor are expected to be beneficial; therefore, this is a Category 1 issue. If, during the project-specific environmental review, the NRC staff determines a detailed analysis of tax revenue costs and benefits is needed for analysis of the range of alternatives considered or relevant to mitigation, the staff may require further information from the applicant.
Environmental Justice			
Construction			
Construction Environmental Justice Impacts	2	Undetermined	Project-specific analysis would be necessary, including analysis of the presence and size of specific minority or low-income populations, impact pathways derived from the plant design, layout, or site characteristics, or other community characteristics affecting specific minority or low-income populations. In performing its environmental justice analysis, the NRC staff will be guided by the NRC's "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions," which was published in the *Federal Register* on August 24, 2004 (69 FR 52040).
Operation			
Operation Environmental Justice Impacts	2	Undetermined	Project-specific analysis would be necessary, including analysis of the presence and size of specific minority or low-income populations, impact pathways derived from the plant design, layout, or site characteristics, or other community characteristics affecting specific minority or low-income populations. In performing its environmental justice analysis, the NRC staff will be guided by the NRC's "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			and Licensing Actions," which was published in the Federal Register on August 24, 2004 (69 FR 52040).
Fuel Cycle			
Operation			
Uranium Recovery	1	SMALL	Table S-3 as codified in 10 CFR 51.51 is expected to bound the impacts for advanced nuclear reactor fuels, because of uranium fuel cycle changes since WASH-1248, including: Increasing use of in situ leach uranium mining has lower environmental impacts than traditional mining and milling methods. Current light-water reactors (LWRs) are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in less demand for mining and milling activities. Less reliance on coal-fired electrical generation plants is resulting in less gaseous effluent releases from electrical generation sources supporting mining and milling activities. Must satisfy the regulatory requirements of 10 CFR part 40, Domestic Licensing of Source Material and 10 CFR part 71, Packaging and Transportation of Radioactive Material.
Uranium Conversion	1	SMALL	Table S-3 is expected to bound the impacts for advanced nuclear reactor fuels because of uranium fuel cycle changes since WASH-1248, including: Current LWRs are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in less demand for conversion activities. Less reliance on coal-fired electrical generation plants is resulting in less gaseous effluent releases from electrical generation sources supporting conversion activities. Must satisfy the regulatory requirements of 10 CFR part 40, Domestic Licensing of Source Material and 10 CFR part 71, Packaging and Transportation of Radioactive Material, and 10 CFR part 73, Physical Protection of Plants and Materials.
Enrichment	1	SMALL	Table S-3 is expected to bound the impacts for advanced nuclear reactor fuels, because of uranium fuel cycle changes since WASH-1248, including: Transitioning of U.S. uranium enrichment technology from gaseous diffusion to gas

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			centrifugation, which requires less electrical usage per separative work unit. Current LWRs are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in less demand for enrichment activities. Less reliance on coal-fired electrical generation plants is resulting in less gaseous effluent releases from electrical generation sources supporting enrichment activities. Must satisfy the regulatory requirements of 10 CFR part 40, Domestic Licensing of Source Material, 10 CFR part 70, Domestic Licensing of Special Nuclear Material, 10 CFR part 71, Packaging and Transportation of Radioactive Material, and 10 CFR part 73, Physical Protection of Plants and Materials.
Fuel Fabrication (excluding metal fuel and liquid-fueled molten salt)	1	SMALL	Table S-3 is expected to bound the impacts for advanced nuclear reactor fuels, because of uranium fuel cycle changes since WASH-1248, including: Current LWRs are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in fewer discharged fuel assemblies to be fabricated each year and due to longer time periods between refueling Less reliance on coal-fired electrical generation plants is resulting in less gaseous effluent releases from electrical generation sources supporting fabrication. Must satisfy the regulatory requirements of 10 CFR part 40, Domestic Licensing of Source Material, 10 CFR part 70, Domestic Licensing of Special Nuclear Material, 10 CFR part 71, Packaging and Transportation of Radioactive Material, and 10 CFR part 73, Physical Protection of Plants and Materials.
Reprocessing	1	SMALL	Table S-3 is expected to bound the impacts for advanced nuclear reactor fuels, because of uranium fuel cycle changes since WASH-1248, including: Current LWRs are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in fewer discharged fuel assemblies to be reprocessed each year. Less reliance on coal-fired electrical generation plants is resulting in less gaseous effluent releases from electrical generation sources supporting reprocessing.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			Reprocessing capacity up to 900 MTU/yr Must satisfy the regulatory requirements of 10 CFR part 40, Domestic Licensing of Source Material, 10 CFR part 50, Domestic Licensing of Production and Utilization Facilities,10 CFR part 70, Domestic Licensing of Special Nuclear Material, 10 CFR part 71, Packaging and Transportation of Radioactive Material, 10 CFR part 72, Licensing Requirements for the Independent Storage of Spent Fuel, High-Level Radioactive Waste, and Reactor-related Greater Than Class C Waste, and 10 CFR part 73, Physical Protection of Plants and Materials.
Storage and Disposal of Radiological Wastes	1	SMALL	Table S-3 is expected to bound the impacts for advanced nuclear reactor fuels, because of uranium fuel cycle changes since WASH-1248, including: Current LWRs are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in fewer discharged fuel assemblies to be stored and disposed. Less reliance on coal-fired electrical generation plants is resulting in less gaseous effluent releases from electrical generation sources supporting storage and disposal. Waste and spent fuel inventories, as well as their associated certified spent fuel shipping and storage containers, are not significantly different from what has been considered for LWR evaluations in NUREG-2157. Must satisfy the regulatory requirements of 10 CFR part 40, Domestic Licensing of Source Material, 10 CFR part 70, Domestic Licensing of Special Nuclear Material, 10 CFR part 71, Packaging and Transportation of Radioactive Material, 10 CFR part 72, Licensing Requirements for the Independent Storage of Spent Fuel, High-Level Radioactive Waste, and Reactor-related Greater Than Class C Waste, and 10 CFR part 73, Physical Protection of Plants and Materials.
Transportation of Fuel and Waste			
Operation			
Transportation of Unirradiated Advanced Nuclear Reactor Fuel	1	SMALL	The maximum annual one-way shipment distance does not exceed 36,760 mi (59,160 km). The annual shipments associated with the one-way shipment distance have been normalized to a net electrical output of 880 MW(e), i.e., 1,100 MW(e)

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			with an 80 percent capacity factor from WASH-1238. The maximum annual round-trip shipment distance does not exceed 73,520 mi (118,320 km). The annual shipments associated with the round-trip shipment distance have been normalized to a net electrical output of 880 MW(e), i.e., 1,100 MW(e) with an 80 percent capacity factor from WASH-1238.
Transportation of Radioactive Waste from Advanced Nuclear Reactors	1	SMALL	The maximum annual round-trip shipment distance does not exceed 182,152 mi (293,145 km). The annual shipments associated with the round-trip shipment distance have been normalized to a net electrical output of 880 MW(e), i.e., 1,100 MW(e) with an 80 percent capacity factor and a shipment volume of 2.34 m^3/shipment from WASH-1238.
Transportation of Irradiated Fuel from Advanced Nuclear Reactors	1	SMALL	The maximum annual one-way shipment distance does not exceed 314,037 mi (505,393 km). The annual shipments associated with the one-way shipment distance have been normalized to a net electrical output of 880 MW(e), i.e., 1,100 MW(e) with an 80 percent capacity factor and a shipment capacity of 0.5 MTU/shipment from WASH-1238. The maximum annual round-trip shipment distance does not exceed 628,073 mi (1,010,786 km). The annual shipments associated with the round-trip shipment distance have been normalized to a net electrical output of 880 MW(e), i.e., 1,100 MW(e) with an 80 percent capacity factor and a shipment capacity of 0.5 MTU/shipment from WASH-1238. A maximum peak rod burnup of 62 GWd/MTU for UO2 fuel and peak pellet burnup of 133 GWd/MTU for TRi-structural ISOtropic (TRISO) fuel.
Decommissioning			
Decommissioning	1	SMALL	The advanced nuclear reactor would be within the bounds of the Decommissioning GEIS based on the following assumptions: Doses to the public would be well below applicable regulatory standards regardless of which decommissioning method considered in decommissioning GEIS is used. Occupational doses would be well below applicable regulatory standards during the license term. The quantities of Class C or greater than Class C wastes generated would be comparable to or less

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
			than the amounts of solid waste generated by reactors licensed before 2002. The air quality impacts of decommissioning are expected to be negligible. Measures are readily available to avoid potential significant water quality impacts from erosion or spills. The liquid radioactive waste system design includes features to limit release of radioactive material to the environment, such as pipe chases and tank collection basins. These features will minimize the amount of radioactive material in spills and leakage that would have to be addressed at decommissioning. The ecological impacts of decommissioning are expected to be negligible. The socioeconomic impacts should be neither detectable nor destabilizing.
Issues Applying Across Resources			
Climate Change	2	Undetermined	The effects of climate change are location-specific and cannot, therefore, be evaluated generically. For example, while climate change may cause many areas to receive less than average annual precipitation, other areas may see an increase in average annual precipitation. Therefore, applicants and staff would address the effects of climate change in the environmental documents for advanced nuclear reactor licensing.
Cumulative Impacts	2	Undetermined	Applications must individually consider the cumulative impacts from past, present, and reasonably foreseeable future actions known to occur at specific sites for proposed advanced nuclear reactors, and briefly present those considerations in supplemental NEPA documentation. The staff would explain whether these individualized evaluations of potential cumulative impacts alter any of the generic analyses and conclusions relied upon for Category 1 issues. The individualized cumulative impact analyses may also identify opportunities where staff might rely upon the generic analyses for some Category 1 issues for which certain of the PPE or SPE values and assumptions might be exceeded.
Non-Resource Related Issues			
Purpose and Need	2	Undetermined	Must be described in the environmental report associated with a given application.

Issue	Category[2]	Finding[3]	Plant Parameter Envelope/Site Parameter Envelope Values and Assumptions[4]
Need for Power	2	Undetermined	Must be described in the environmental report associated with a given application.
Site Alternatives	2	Undetermined	Must be described in the environmental report associated with a given application.
Energy Alternatives	2	Undetermined	Must be described in the environmental report associated with a given application.
System Design Alternatives	2	Undetermined	Must be described in the environmental report associated with a given application.

[1] Data supporting this table are contained in NUREG-2249, "Generic Environmental Impact Statement for Advanced Nuclear Reactors" ([MONTH] 2022).
[2] The categories are defined as follows:
Category 1 issues – environmental issues for which the NRC has been able to make a generic finding of SMALL adverse environmental impacts, or beneficial impacts, provided that the applicant's proposed reactor facility and site meet or are bounded by relevant values and assumptions in the PPE and SPE that support the generic finding for that Category issue.
Category 2 issues – Environmental issues for which a generic finding regarding the environmental impacts cannot be reached because the issue requires the consideration of project-specific information that can only be evaluated once the proposed site is identified. The impact significance (i.e., SMALL, MODERATE, or LARGE) for these issues will be determined in a project-specific evaluation.
N/A - Issues related to exposure to electromagnetic fields (EMFs) for which there is no national scientific agreement regarding adverse health effects.
[3] A finding of SMALL impacts means that environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the 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 as the term is used in this table. For issues where probability is a key consideration (i.e., accident consequences), probability was a factor in determining significance.
[4] Because the Category 2 issues require a project-specific review, there are no associated values and assumptions of the plant parameter envelope and site parameter envelope. A brief summary explanation for the designation of the Category 2 issues is provided in lieu of values and assumptions.

Dated MONTH DAY, 20XX.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,
Secretary of the Commission.