

**Response to Public Comments on Draft Regulatory Guide-4026, “Preparation of Environmental Reports for Nuclear Power Stations,” Proposed Revision 3 of Regulatory Guide 4.2**

On February 13, 2017, the U.S. Nuclear Regulatory Commission (NRC) published a notice in the *Federal Register* (82 FR 10502) notifying the public that Draft Regulatory Guide (DG)-4026 (Proposed Revision 3 to Regulatory Guide [RG] 4.2), “Preparation of Environmental Reports for Nuclear Power Stations”) was available for public comment. The original public comment period ended April 14, 2017, and was extended to May 31, 2017 (*Federal Register* (FR) notice dated March 29, 2017; 82 FR 15544). The NRC received comments from the organizations listed in the table below.

By using a unique correspondence identifier, each set of comments from a commenter can be traced back to the original comment submittal. After the comment period concluded, the NRC staff considered and dispositioned all comments received. To identify individual comments, the review team reviewed and delineated comments within each piece of correspondence received related to the DG.

The table below provides a list of commenters identified by name, affiliation (if given), comment number, and source of the comment.

<b>Commenter</b>	<b>Affiliation</b>	<b>ADAMS Accession Number</b>	<b>Correspondence ID</b>
Nima Ashkeboussi	Nuclear Energy Institute	ML17079A136 and ML17156A559	NEI
Robert Tomiak	U.S. Environmental Protection Agency	ML17151A308	EPA
Marj Darling	N/A	ML17163A092	MD
Greg Halnon	FirstEnergy Corporation	ML17163A093	GH
Charlene Dwin-Vaughn	Advisory Council on Historic Preservation	ML17163A094	ACHP

**Comments and Responses**

This section presents the comments and responses organized by topic category. When the comments resulted in a change in the text of the DG, the corresponding response refers the reader to the appropriate section of the RG where the change was made. In some cases, a single response applies to two or more comments.

**Comments Concerning General Guidance to Applicants**

**Comment:** C. Staff Regulatory Guidance, III. Non-NRC Permits and Approvals discussion, page 18: In order to address appropriate state requirements. NRC may want to consider referencing EPA’s “309 Reviewers Guidance for New Nuclear Power Plant Environmental Impact Statements” in this section. Appendix A of this document provides examples of activities that may require state authorizations, permits, or certifications. This document is located at: <https://www.epa.gov/sites/production/files/2014-08/documents/309-reviewers-guidance-for-new-nuclear-power-plant-eiss-pg.pdf>. **(EPA-1 [Tomiak, Robert])**

**Response:** *The NRC agrees with this comment and has added a reference to the U.S. Environmental Protection Agency's (EPA's) guidance document, "309 Reviewers Guidance for New Nuclear Power Plant Environmental Impact Statements," Appendix A, as a footnote in Section C.III.*

**Comment:** The draft presents considerable growth in regulatory guidance. For example, the draft is 173 pages. RG 4.2, Rev 2 is 100 pages. NEI 10-07, Rev 1 is 50 pages. Recommendation: Areas for consolidation and elimination of redundancy should be identified; including the removal of sections identified in this attachment. **(NEI-4 [Ashkeboussi, Nima])**

**Response:** *The NRC disagrees with the comment. Environmental laws, regulations and practice have changed considerably since the mid-1970s, as reflected in current staff practice. The NRC has updated the RG to meet current regulations and staff practice. The RG also incorporates two interim staff guidance documents, COL/ESP-ISG-026, "Interim Staff Guidance on Environmental Issues Associated with New Reactors," and COL/ESP-ISG-027, "Interim Staff Guidance on Specific Environmental Guidance for Light Water Small Modular Reactor Reviews." The ISGs addressed changes to environmental statutes, regulations, and Executive Orders that directly affect the information required by the NRC to develop environmental impact statements (EISs). NEI 10-07 is not a good basis for comparison because it does not cover the scope of information covered in the RG. The NRC did not identify any sections that should be removed for redundancy. No changes were made to the RG based on this comment.*

**Comment:** The revision should clearly state the extent to which the guidance in RG 4.2 Supplemental 1, "PREPARATION OF ENVIRONMENTAL REPORTS FOR NUCLEAR POWER PLANT LICENSE RENEWAL APPLICATIONS" is to be retained or incorporated within this document. **(NEI-5 [Ashkeboussi, Nima])**

**Comment:** The revision needs to be clear that this guidance only applies to the initial issuance of a permit, license, or other authorization. (ER guidance for license renewal is described in RG 4.2, Supplement 1, Revision 1). **(NEI-14 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with the comments and has revised the text in Section B., "Discussion," to state that RG 4.2, Supplement 1, Revision 1, applies to the development of environmental reports (ERs) for reactor license renewal.*

**Comment:** A. Introduction, Purpose: The Purpose statement is that this guidance is specific to applications for a "new nuclear power plant". Clarification is needed as to the implications of siting a new power plant in conjunction with existing (brownfield) facilities, whether nuclear or other industrial type facilities. **(NEI-6 [Ashkeboussi, Nima])**

**Comment:** A. Introduction, Purpose. Some discussion is needed to address potential brownfield applications, whether adding existing electricity production or process heat applications. **(NEI-15 [Ashkeboussi, Nima])**

**Response:** *The NRC disagrees with the comments. Applicants would address impacts of the proposed action in the same way regardless of where the project is sited. While the outcome of an analysis might be affected by the starting condition of the site, the guidance to evaluate impacts is the same. For example, building at an existing site might not require clearing any new land. That fact would be reflected in the comparison of that site to others that required clearing land. No change was made to the RG based on this comment.*

**Comment:** Section 6.2, Transportation. The draft guide, in many locations, refers to a 40-year lifetime for the plants. However, plants are currently being designed and approved for 60-year lifetimes and reviewed for second license renewal out to 80 years. Revise to the more general “lifetime” of the plants to provide flexibility for applicants in their permitting and analyses. (NEI-7 [Ashkeboussi, Nima])

**Response:** *The NRC understands the comment. Although plants may be designed for longer lifetimes, the original license term is for 40 years, with the license renewal term being an additional 20 years. For clarification, the word “lifetime” was changed in the RG to “license,” which is a more accurate term.*

**Comment:** The text discusses the applicability of the Guidance to Large Light Water Reactors and Light Water SMRs. The text identifies non-applicability to non-Light Water SMRs, however the text is silent on the subject of non-light water Large reactors. Clarify the applicability of this guidance to large non-light water reactors. (NEI-8 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with this comment. The NRC staff revised the guidance in Appendix C, Section C.2.11 to specify the differences in information that should be provided in ERs supporting license or permit applications for non-light-water reactors (non-LWRs).*

**Comment:** In defining terminology and describing the purpose and need statement, only the production of electricity is addressed. Other uses for power (hydrogen production, desalination and steam production for process heat applications) are not provided for in the purpose and need statement. For example, Section 8.0 requires that “The need for power analysis should be limited to the discussion of the supply and demand for electricity.” DG-4026 should allow for the production of thermal power in the form of steam or heat for applications other than electricity generation, particularly in the purpose and need statement. (NEI-9 [Ashkeboussi, Nima])

**Comment:** Chapter 1, Section 1.2 Purpose and Need: The DG discusses certain alternatives to “baseload electricity,” but states inappropriately that “it is the production of electricity that allows the project to be justified in terms of benefits.” A nuclear plant that does not produce electricity, but rather is dedicated to desalination, district heating, or other process heat applications would not be subject to an analysis comparing against electrical generation alternatives.

Restate the regulatory basis that is associated with evaluating the purpose of the project, and alternatives to that project, without restricting the project to electricity production as the sole basis for justification in terms of benefits. (NEI-31 [Ashkeboussi, Nima])

**Response:** *The NRC has considered other uses for power, but determined that there is insufficient information available to effectively address such uses at this time. Therefore, the staff did not consider uses other than electricity production in describing the purpose and need statement in the RG. An applicant for such a project should consult with the NRC staff in accordance with 10 CFR 51.40, “Consultation with NRC Staff” to discuss the information and analysis that the ER should provide. No change was made to the RG based on this comment.*

**Comment:** This extensive RG revision should be reconciled with NUREG-1555, as the agency is undertaking for RG-1.206 and NUREG-0800. Guidance to applicants and the staff should be maintained in lock step to the maximum extent practical. (NEI-10 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with this comment. The staff is currently updating NUREG-1555, “Environmental Standard Review Plan: Standard Review Plans for Environmental Review for Nuclear Power Plants,” and will ensure that RG 4.2, Rev. 3 and NUREG-1555, Rev. 2, are consistent. No change was made to the RG based on this comment.*

**Comment:** A footnote or parenthetical clarification would be useful to indicate that circumstances could dictate variability in certain aspects of this DG, e.g., if an applicant is a federal agency, where NEPA or Executive Order responsibilities might mirror or replace those of other federal agencies, or where the applicant might be exempt from certain regulations or permit requirements. (NEI-11 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with the comment and has added text in Section C.I to state that a Federal agency applicant should inform the staff of its National Environmental Policy Act of 1969, as amended, (NEPA) and regulatory responsibilities during the pre-application review.*

**Comment:** Section 2.6.2 includes a discussion of protected information for cultural resources. There are other topics that the staff acknowledges should be protected from inadvertent disclosure (e.g., certain well and drinking water intake information). The DG should be updated to reflect the most current information regarding information to be withheld under 10 CFR 2.390. (NEI-12 [Ashkeboussi, Nima])

**Response:** *The RG contains the most current information regarding information to be withheld under 10 CFR 2.390, “Public inspections, exemptions, requests for withholding.” No change was made to the RG based on this comment.*

**Comment:** It’s not clear that NRC performed a Cumulative Impacts Considerations review of DG-4026. Describe the NRC’s evaluation that the DG avoid unnecessary and cumulative impacts of NRC regulatory actions and process changes and does not represent an expanded scope over current guidance. (NEI-13 [Ashkeboussi, Nima])

**Response:** *This revision to RG 4.2 was written to reflect current staff guidance for an ER. For example, the guidance in COL/ESP-ISG-026 and COL/ESP-ISG-027 was interim staff guidance that was incorporated into this RG revision. The revision is not duplicative of other staff guidance. When updating regulatory guidance, it is NRC practice to issue draft guides for public comment.*

**Comment:** A. Introduction, Related Guidance. It’s not clear that the content of DG-4026 has been revised and updated to make it consistent with the other listed guidance. For example, what if the activities/scope described in RG 4.11 (Terrestrial Environmental Studies for Nuclear Power Stations) go beyond those described here? In that scenario, wouldn’t the applicant be subject to unnecessarily duplicative “requirements” (bearing in mind that this is guidance) and inconsistent expectations re level of detail? Clarify to what extent the revised DG-4026 is intended to replace or supplement other existing NRC guidance? (NEI-16 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with this comment and, in order to clarify the guidance with regard to duplication and inconsistency, has provided clarifying text in the “Related Guidance” section to explain the differing purposes of the related guidance listed in RG versus the guidance in presented in this RG. While the guidance documents listed in this section may overlap with guidance in this RG, the purposes of the documents are different. Some of the related documents offer guidance in the development of reference sources that may be useful in the development of an ER, but, unlike this RG, none are specifically intended to offer guidance directly pertinent to preparing the ER itself.*

**Comment:** A. Introduction, Related Guidance: RG 4.24, “Aquatic Environmental Studies for Nuclear Power Stations,” is not included in the Related Guidance documents. NRR Review Standard RS-002, Attachment 3, “ESP Scope and Associated Review Criteria for ER:” is not included. (NEI-17 [Ashkeboussi, Nima])

**Response:** *The NRC agrees in part with the comment and has added RG 4.24 to the “Related Guidance” section. The information provided in Part C is only applicable to ERs for combined license (COL) applications not referencing an early site permit (ESP). Appendix A provides supplemental guidance for the development of ERs for other authorizations and licenses that can be granted by the NRC under 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” and 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” including ESPs. Because RS-002 applies to ESPs, a reference to this document was added to Appendix A of this RG.*

**Comment:** B. Discussion, Background. B: Two ISG documents are described. It is noted that the ISG are to be subsumed into this revision, yet that has not occurred. (For example, Section 2.7.2.) 79 FR 52373 notes: The NRC staff intends to incorporate the final approved COL/ESP–ISG–026 into the next revision of the Environmental Standard Review Plan and related guidance documents. Incorporate the ISG guidance, to the extent the guidance remains valid, within this revision to RG 4.2. **(NEI-18 [Ashkeboussi, Nimal])**

**Response:** *The NRC understands this comment. The guidance from the ISGs related to information that applicants should include in its ER has been incorporated in this update to RG 4.2, as appropriate. The guidance from the ISGs related to information that the staff should include in its environmental impact assessments will be incorporated into NUREG-1555.*

**Comment:** B. Discussion, Background: The last sentence includes “climate change” with guidance included in Section 2. The last sentence in Section 2.7.1 mentions the “latest U.S. Global Change Research Program Report” as guidance yet does not draw in any applicable guidance from the Research Program Report. Clarify the NRC’s participation in that activity and what guidance an applicant should infer from the report. **(NEI-19 [Ashkeboussi, Nimal])**

**Response:** *The NRC will address the impacts from GHGs and climate change in environmental reviews in accordance with Commission direction in CLI-09-21. The staff will follow guidance incorporated into the next revision of NUREG-1555, “Environmental Standard Review Plan: Standard Review Plans for Environmental Review for Nuclear Power Plants.” The staff refers to the latest Global Change Research Program (GCRP) report not as guidance but as a useful source of climate change information. The GCRP is the authoritative U.S. government source on climate change in the United States. The national climate assessment published by GCRP describes the impacts of climate change in various sectors of the United States. This RG 4.2 refers to “the latest GCRP report,” such that the applicant is not being directed to a specific report that could be superseded by a more recent report after publication of RG 4.2. The GCRP has a legal mandate to conduct a national climate assessment every 4 years (the most recent assessment was published in 2014, “Climate Change Impacts in the United States: The Third National Climate Assessment”). The applicant should discuss in its ER “potential climate change in the vicinity of the site over the period encompassing the licensing action and impacts on relevant meteorological parameters (e.g., temperature, precipitation, and the frequency and severity of storms” (see RG 4.2 Section 2.7.1); the latest GCRP report is one source of this information. No change was made to the RG based on this comment.*

**Comment:** B. Harmonization with International Codes and Standards: To what extent do the international codes and standards alter NRC policy, regulation, or guidance? Is it NRC’s policy to harmonize with these standards? Historically this has not been the case. General statement as made on Pg. 11 (i.e., “[u]se of this RG would, in general, be consistent with the principles and basic aspects of environmental impact assessment described in the IAEA Technical Reports Series and Safety Guides on health and environmental impacts and site evaluation.”) are not very compelling. Clarify extent to which this DG is informed by non- NRC-endorsed codes and standards and/or the extent to which this DG is

intended to indicate conformance with IAEA or other non-US requirements. (NEI-20 [Ashkeboussi, Nimal])

**Response:** *The NRC disagrees with this comment. It is NRC policy to harmonize (be consistent) with international codes and standards, not necessarily to conform to them. See [International Policy Statement](#). This RG is consistent with international standards; it is not intended, nor is there any requirement, to conform to International Atomic Energy Agency (IAEA) standards or other non-U.S. standards. No change was made to the RG based on this comment.*

**Comment:** B Documents Discussed in Staff Regulatory Guidance: “This RG addresses, in part, the use of one or more codes or standards developed by external organizations, and other third-party guidance documents. These codes, standards and third-party guidance DG-4026, Page 12 documents may contain references to other codes, standards or third-party guidance documents (“secondary references”). If a secondary reference has itself been incorporated by reference into NRC regulations as a requirement, then applicants must comply with that standard as set forth in the regulation. If the secondary reference has been endorsed in an RG as an acceptable approach for meeting an NRC requirement, then the standard constitutes a method acceptable to the NRC staff for meeting that regulatory requirement as described in the specific RG.”

10 CFR 51 is a procedural rule. Asserting that a code or standard invoked in this RG constitutes a compliance obligation for all aspects of that and secondary codes and standards does not seem appropriate. Assess this language for whether it is appropriate for this DG. (NEI-21 [Ashkeboussi, Nimal])

**Response:** *The NRC agrees that third-party guidance documents discussed in Section B and the Appendices of this RG have not been endorsed; therefore, the Section “Documents Discussed in Staff Regulatory Guidance” has been deleted.*

**Comment:** C. Staff Regulatory Guidance, I. Summary: Standard Design Approvals and Manufacturing Licenses should also be discussed; this comment also affects Appendix A. (NEI-22 [Ashkeboussi, Nimal])

**Response:** *The NRC agrees with the comment. The staff has added a discussion of manufacturing licenses to Appendix A, and added manufacturing licenses to the list of 10 CFR Part 52 authorizations in Section C.1. However, standard design approvals do not require an environmental review, and the staff has not added such approvals to the guide.*

**Comment:** C. Staff Regulatory Guidance, I. Summary: Clarify that “station” may not include collocated facilities within the site. This is contrary to statement that “existing or proposed facilities not associated with the production of electricity are considered part of the station.” Also clarify distinction between “station” and “plant.” Also, see other comments regarding “production of electricity” as the presumed purpose for a plant, i.e. address definitional implications of co-location (for example, with industrial facilities) for process heat use. (NEI-23 [Ashkeboussi, Nimal])

**Comment:** C. Staff Regulatory Guidance, I. Summary: Under “PLANT,” the term “unit” is mis-defined. Delete “Generally, unit is used only when the applicant is proposing a multi-unit plant for large light water reactors.” (NEI-24 [Ashkeboussi, Nimal])

**Comment:** The definition of “unit” should be expanded to address modular SMRs and advanced non-LWRs. Furthermore, alignment should be achieved between all of the sections. For example:

Section 3.3, “Building Activities” uses “module assembly” when describing construction/assembly of “pieces” to be installed as an integral piece. This is consistent with DG- 4026 being large LWR-centric in scope.

Section 4.9, “Radiological Health” paragraph 2 addresses providing estimated annual dose to construction workers in a new unit or “module construction area” as a result from radiation from onsite radiation sources such as existing plant(s). In the first bullet at the end of Section 9 states that “... the ER should include the following:” “the physical layout ... co-located reactor modules ...”

Appendix C defines an SMR as a “reactor unit” with nominal output of 300MWe.” (NEI-25 [Ashkeboussi, Nima])

**Response:** *The NRC understands the comments and has revised the RG to remove the definitions. In its place, the staff has added the following text in Section C.1: “The NRC staff in its EIS generally follows the terminology used by the applicant in its ER to describe commonly used terms such as station, plant, unit, facility, or project. The applicant should define the terms that it uses and be clear and consistent throughout its ER.”*

**Comment:** C. Staff Regulatory Guidance, V. Mitigation of Adverse Effects: The DG states, “Applicants are required to consider alternatives available for reducing or avoiding any adverse effects as described in 10 CFR 51.45(c).” Delete “any.” The statement as written overstates the regulatory requirement in 10 CFR 51.45(c). (NEI-26 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with the comment and has deleted the word “any” from Section C.V. of the RG.*

**Comment:** C. Staff Regulatory Guidance, V. Mitigation of Adverse Effects: This paragraph states the applicant “provide the reason why the mitigation measures are considered reasonably foreseeable.” There does not appear to be a regulatory basis for this requirement; CEQ regulations do not use “reasonably foreseeable” in the context of mitigating measures. While the examples of what is considered a reasonable mitigation measure are useful, the basis for an obligation to justify why a mitigating measure is reasonable is not clear. Delete “The applicant should provide the reason why the mitigation measures are considered reasonably foreseeable.” (NEI-27 [Ashkeboussi, Nima])

**Response:** *The NRC disagrees with the comment. However, the staff has clarified the basis for its consideration of mitigation in Section C.V. as follows: “An applicant should identify in the ER all relevant, reasonably foreseeable mitigation measures that could reduce or avoid adverse effects, even if they are outside the jurisdiction of the NRC. This approach is consistent with CEQ’s response documented in Question 19b of its 40 questions (see 46 FR 18026).”*

*Reference: 46 FR 18026. March 23 1981. “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations.” Federal Register, Council on Environmental Quality, Executive Office of the President, Washington, D.C. ADAMS Accession No. ML12088A274.*

**Comment:** C. Staff Regulatory Guidance, VIII Presentation of Applicant Information: The use of “in qualified terms” is unclear [sic Section C.VIII. Presentation of Applicant Information]. Clarify or eliminate the term “qualified.” (NEI-28 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with the comment, and clarified the text in Part C, Section VIII to reflect that information and data provided in or with the application should be at a level sufficient for the NRC staff to comply with Section 102(2) of NEPA.*

**Comment:** *C. Staff Regulatory Guidance, VIII Presentation of Applicant Information: The DG requires submittal of “description and documentation of any computer modeling codes that are used to support analyses in sufficient detail to allow the NRC staff to reproduce the model results.”*

The combination of “any” and “reproduce the model results” constitutes an excessive regulatory burden. There is no regulatory basis for the staff to reproduce the results of every model employed, but rather to reproduce results on a sufficient sample basis to reach a reasonable assurance finding. The practice that has evolved where NRC staff request docketed I/O files for a substantial subset of computer codes used in an application represents and undue burden an increases the size of the docketed application, sometimes by tens of thousands of pages.

NRC staff/management should establish clearer guidance for when analytical results must be reproduced by the staff. **(NEI-29 [Ashkeboussi, Nima])**

**Comment:** Chapter 5, Section 5.11.2, para. 3, third bullet: Section 5.11.2 states, “The applicant should provide...input and output files used in the analysis should be provided to the NRC staff for confirmatory review”.

It is unclear how these are to be provided to the NRC staff for confirmatory review. That is, whether these files may be audited or whether they need to be placed onto the docket.

Clarify that these files are to be provided during an audit and not formally submitted or placed on the docket. **(NEI-66 [Ashkeboussi, Nima])**

**Response:** *The NRC understands the comments. The NRC is required by 10 CFR 51.70(b) to “independently evaluate and be responsible for the reliability of all information” the staff uses in its review, such as in the draft EIS. In addition, 10 CFR 51.41, “Requirement to submit environmental information,” states that the Commission may require an applicant to submit such information “as may be useful in aiding the Commission in complying” with NEPA. Therefore, the applicant’s ER and supporting documents and calculations available for audit should provide sufficient detail of key models, assumptions, parameters, conditions, input data, resulting output, and approaches relied upon for the conclusions in the applicant’s analyses. In addition, the NRC staff may perform independent computational evaluations as part of its environmental review.*

*The NRC may conduct a more efficient review when the applicant’s model input and output files are made available to staff as part of its independent evaluation of parameter and modeling choices that are significant to the conclusions. While this has been done in the past via the docketing process, the NRC has found that Regulatory Audits can facilitate staff’s clarity in understanding the applicant’s methods, models, assumptions, and parameter values chosen to support its application. Audit interactions with the applicant may include discussions as well as independent evaluations of calculations, model input parameter files and output results files and the sensitivities of model results to different parameter values and modeling approaches. As such, audits, when utilized in an efficient and effective manner, can significantly reduce the need for requests for additional information (RAIs) by clearing up sources of misunderstanding of the summary level discussion in the ER and provide clarity about the significant elements of the applicant’s analyses that are fundamental to their conclusions. As appropriate, the NRC staff may issue RAIs to address specific issues and concerns that it may have about the applicant’s conclusions. Specific information that is identified in the audit and/or RAI processes may need to be placed on the docket if determined to be necessary to support the NRC staff’s environmental review conclusions. NRC staff clarified in appropriate sections of the RG the type information needed in the ER in order for the staff to conduct its review.*



**Comment:** C. Staff Regulatory Guidance, VIII Presentation of Applicant Information: The DG states: “Information obtained from publications or other information from the literature should be concisely summarized and documented using references to original data sources. Where the availability of original sources that support important conclusions is limited, the sources should be adequately summarized in the application and should be available for auditing in the applicant’s records. In all cases, information derived from published results should be clearly distinguished from information derived from the applicant’s field measurements.

“The information the NRC uses to conduct and inform its NEPA environmental reviews, including information in the ER, must be publicly available, as appropriate. Therefore, applicants should ensure that the information included in the ER can be made publicly available.” In practice, these reasonable requirements have been translated into recent requests by the staff for virtually all references from the application to be filed “on the docket,” even for information already publicly available. Review of this information during an audit has not been sufficient. Also, “publicly available” does not mean an applicant is obligated to provide copies for the staff or members of the public (e.g., consensus standards are publicly available, but often require purchase).

Better guidance is needed for applicants and staff to understand what “publicly available” means, and when an applicant is required to “docket” supporting information such as references. Clarification also is warranted regarding making copyrighted or publicly withheld information available to the staff.

Clarify existing language by reinforcing:

- References and other supporting information are not required to be placed “on the docket,” but are appropriate for review in an audit setting.
- Copyrighted information is not expected to be submitted by the applicant.
- Information not suitable for public disclosure should be withheld pursuant to 10 CFR 2.390.

**(NEI-30 [Ashkeboussi, Nima])**

**Response:** *The NRC understands the comment and has revised Section C.VIII to state:*

*“The information the applicant provides to support the conclusions in the NRC’s EIS must be publicly available. Because the EIS relies on information from the ER, applicants should ensure that key information supporting the conclusions in the ER can be made publicly available. Publicly available information is information that can be accessed by the public. For example: 1) publicly available information in the NRC’s Agencywide Documents Access and Management System (ADAMS) recordkeeping system or maintained in the NRC’s Public Document Room, 2) copyrighted information with proper citation, or 3) a publicly accessible Web site with a reference that allows the NRC and public to find the information. The applicant may reference copyrighted information but must not submit copyrighted material as public information in support of an ER.*

*However, the copyrighted information should be properly referenced so that the NRC and the public can access it. Regarding sensitive information, a request for withholding such information from the public must meet the requirements of 10 CFR 2.390, “Public inspections, exemptions, requests for withholding;” if the information satisfies those requirements and the Commission grants the request to withhold the information from the public, then the information would not be made publicly available. Applicants should also ensure the consistency of information presented within different sections of the ER, as well as between the ER and the safety analysis report.*

*If the NRC is not relying on the information to reach its conclusions in the EIS, applicants are not required to make references and other supporting information publicly available, but are appropriate for review in an audit setting. If the NRC is relying on the information in its EIS, and the information is not otherwise publicly available as discussed above, then the information must be docketed so that it can be made publicly available.”*

**Comment:** Chapter 4, Section 4.0 Environmental Impacts from Construction of the Proposed Project: This section requires discussion of activities that are not “construction” pursuant to NRC regulation.

Change title of this section to “Environmental Impacts from Construction and Preconstruction Activities”

Make any necessary conforming changes within the text of this section, ensuring proper jurisdictional boundaries (between NRC-regulated construction and non-NRC-regulated preconstruction) are maintained. (NEI-48 [Ashkeboussi, Nima])

**Response:** *The NRC understands the comment. The staff did not change the title. However, in Section 4.0, the staff did provide the regulatory citation that specifies activities that are not construction. The definition of what is construction and what is not construction or preconstruction is defined in 10 CFR 51.4., “Definitions.”*

#### **Comments Concerning Site Layout and Project Description**

**Comment:** Chapter 3, Section 3.4.1, Plant Environment Interfaces during Operation: The 3rd bullet on Air Interfaces should address potential applications that use air as the ultimate heat sink. Revise to address potential applications that use air as the ultimate heat sink. (NEI-47 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with the comment and revised Section 3.4.1 to address potential applications that use air as the ultimate heat sink.*

#### **Comments Concerning Land Use**

**Comment:** Superfund and/or Brownfield Sites: While EPA understands that land-use impacts associated with operations are expected to be minimal because activities are generally restricted to previously disturbed areas, it may be useful for the applicants to be aware of nearby Superfund and/or Brownfield sites in order to avoid interference with nearby clean-up activities or site disturbances. For this reason, NRC may consider including a statement that the applicant can contact state agencies or regional EPA Superfund divisions for site specific information [sic] if necessary. (EPA-8 [Tomiak, Robert])

**Response:** *The NRC agrees with this comment and has made the following change in Section 4.1 of the Guide:*

*Applicants should be aware of nearby Superfund and/or industrial or previously industrial sites in order to avoid interference with nearby clean-up activities or site disturbances. The applicant can contact State agencies or regional EPA Superfund divisions for site specific information if necessary. In addition, if the site is industrial or a previously industrial site, the applicant should consider contacting EPA or State agencies to see if there is any possible contamination from previous industrial activities that may require clean-up.*

**Comment:** Chapter 2, Section 2.1 Land Use: The 1st paragraph notes: “Definition of vicinity and region is left to the discretion of the applicant; however, as a general suggestion, a typical distance limit of a 6-mi radius from the site perimeter can be used for vicinity...”

Granted, this is for environmental considerations, the basis for a “6 mile” recommendation should be considered in light of other distances that are specified in other NRC guidance (for example, see safety and emergency planning guidance). Such guidance directs an applicant to provide site data that is to be used in specified models.

While the 50-mile radius is described in multiple other sections of this draft, the “6 mile” recommendation only appears in this one section. (NEI-32 [Ashkeboussi, Nima])

**Response:** *The NRC agrees that some clarification is needed. The guidance provided in Section 2.1 regarding vicinity and region is for the purposes of evaluating land use impacts only. The text has been modified to indicate that vicinities or regions (or other geographic designations) of the same or differing radii may be appropriate for evaluating other environmental impacts.*

**Comment:** Chapter 2, Section 2.1 Land Use: While the 3rd paragraph does recognize industrial use, the 2nd paragraph does not and is directed solely at traditional electricity producing NPPs (see also section 2.1.2). Some clarifications are warranted for consideration of implications of offsite impacts due to industrial co-location uses. (NEI-33 [Ashkeboussi, Nima])

**Response:** *The commenter may not fully understand the contents of Section 2.1. The second paragraph provides examples of categories of offsite facilities that are commonly part of a nuclear power plant project under review, but they are only examples. This is not meant to be an inclusive list of possibilities, and ERs must be tailored to the specific project they support. The third paragraph discusses general categories of land use that may be present in the surrounding region other than the prospective plant under review.*

**Comment:** Chapter 2, Section 2.1.2 Transmission-Line Corridors and Other Offsite Areas: This section suggests that while NRC recognizes that new transmission lines and corridors may not be constructed or owned by the applicant (paragraph 1), the applicant is still responsible for providing a discussion of certain land use information relating to new transmission-related facilities, who would build them and own them “and the associated process for obtaining approved rights of way” – plus planned routing, etc.

This section of the guidance is unfairly burdensome for the applicant. During the last several years there has been inconsistent NRC treatment of transmission lines in an EIS – particularly the question of how much an applicant can be expected to know about transmission lines being built (or to be built in future) by regional transmission organizations (not the applicant.) The issue was litigated at NRC in connection with the Fermi 3 COL application. DG-4026 does not appear to reflect the most recent NRC position. (NEI-34 [Ashkeboussi, Nima])

**Response:** *NRC recognizes that applicants may only be able to provide limited high-level or broadly defined information on possible new transmission lines serving a new plant. In response to the comment, NRC revised Section 2.1.2 to explain that the ER should only contain the best available information on transmission line and other offsite facilities available to the applicant at the time of application. NRC has sought over the course of its last several new reactor EISs to present enough information on transmission lines to provide for a meaningful evaluation of cumulative environmental impacts without making unreasonable or impracticable demands for information from applicants.*

**Comment:** Chapter 2, Section 2.1.2 Transmission-Line Corridors and Other Offsite Areas: The section on Transmission-Line Corridors discusses construction activities focusing primarily on new TL corridors and facilities.

(1) Eliminate use of “construction” regarding non-NRC-licensed activities

(2) To clarify that certain information is also expected for alterations to existing lines/corridors, add “(or significant changes to existing lines and corridors)” between “new transmission lines and corridors” and “are relevant” in the last sentence of the first paragraph. (NEI-35 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with this comment and has changed Section 2.1.2 to eliminate reference to “construction” of transmission lines and reworded the last sentence of the first paragraph. The editing also explains that information is needed on alterations to existing offsite facilities such as transmission lines as well as on new facilities.*

### **Comments Concerning Hydrology**

**Comment:** Water Monitoring, page 32: This section provides a reasonable monitoring process. However, since nuclear projects have long life spans with geological and ecological variability across the country, it might be advisable for NRC to recommend split sampling with state regulatory agencies in an effort to streamline the monitoring process and to incorporate a higher level of compliance. (EPA-2 [Tomiak, Robert])

**Response:** *The NRC understands the comment. As stated in the first paragraph, the purpose of pre-application monitoring, here, is to establish a baseline for assessing subsequent environmental effects. For the purpose of monitoring throughout the operational life of the facility, state regulatory agencies may require additional split sampling and monitoring as required by state environmental regulations. No change was made to the RG based on this comment.*

**Comment:** Chapter 2, Section 2.2 Water Resources: This section introduces the term “Region of Interest (ROI)” as compared to terms used in Sec. 2.1, e.g., “site,” “vicinity,” and “region.” Mixing of these terms and differing definitions could lead to confusion on just what area is being examined for each section.

The DG would benefit from a close “scrub” of such terms to ensure they are being used/ applied consistently. Staff should consider a “site-related terminology” summary as an aid to ensure consistent usage. (NEI-36 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with the comment. The term “Region of Interest,” has been replaced by “Resource Impact Area,” and the term has been defined. Changes were made to the RG based on this comment.*

### **Comments Concerning Ecology--Terrestrial Resources**

**Comment:** Wetlands, page 33: EPA recommends that this section reference the 2008 Mitigation Rule. EPA also recommends including a discussion about delineations being performed in conjunction with the Army Corps of Engineers along with a discussion of Avoidance and Minimization as well as jurisdictional determinations. (EPA-3 [Tomiak, Robert])

**Response:** *The NRC agrees with this comment. The staff has edited Section 2.3.1 to indicate that the NRC uses information on jurisdictional determinations by the U.S. Army Corps of Engineers or other applicable agencies in order to evaluate the possible significance of impacts to wetlands and interacting terrestrial and aquatic habitats. The staff believes that the remainder of the comment is best addressed by editing Section 4.3.1. The staff has inserted text in Section 4.3.1 that calls for any discussion of wetland mitigation in the ER to address opportunities for avoidance and minimization of wetland impacts as well as possible compensatory mitigation, and to discuss how mitigation under the purview of the U.S. Army Corps of Engineers would comply with 33 CFR Part 332, commonly referred to as the “2008 Mitigation Rule.”*

**Comment:** Chapter 2, Section 2.3.1 Terrestrial Habitats, 3rd bullet: This bullet (and similar statements in other terrestrial and aquatic ecology sections) says that “[s]tudies would ideally show the condition of the ecological resources that exist no more than 5 to 10 years prior to NRC receiving the application,” and requests justification for use of older data.

Yet the staff routinely questions use of data marginally older than five years, and suggests that “two to five years” should be the threshold for consideration of “new and significant” information (e.g., in developing a COLA incorporating an ESP).

See also comment on Appendix A, Pg A-2, Sec. A.2 below.

The generally acceptable range of 5-10 years is appropriate, but should be applied consistently throughout the DG. **(NEI-37 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees that 5-10 years is appropriate as suggested guidance. The RG not only uses 5-10 years but also includes an additional statement that, if older ecological baseline data are used, a discussion of the basis for determining that the data provide for an accurate and meaningful evaluation of potential impacts should also be included. As written, the RG already includes a provision indicating that data even older than the 5-10-year guideline may be used, if justified. No change was made to the RG based on this comment.*

**Comment:** Chapter 2, Section 2.3.1 Wetlands: The DG requests “[i]dentification, when possible, of whether each wetland is under the jurisdiction of the Clean Water Act or applicable State or local wetland protection laws.”

“When possible” over prioritizes this information.

Change to:

“Identification, when practical, of whether each wetland is under the jurisdiction of the Clean Water Act or applicable State or local wetland protection laws (note that a jurisdictional determination may not have been made at the time of an application).” **(NEI-38 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with this comment and made the suggested edits to Section 2.3.1. However, the staff used “practicable” instead of “practical”; the staff believes that the former better captures the intent of the comment.*

### **Comments Concerning Socioeconomics**

**Comment:** Chapter 2, Section 2.4, Socioeconomics: This section states that the application should discuss where the majority (80 percent or more) of socioeconomic impacts will be experienced. Justification or clarification should be provided for the 80 percent threshold identified. **(NEI-39 [Ashkeboussi, Nima])**

**Response:** *The RG has not changed the process for identifying the area of primary economic impacts, but has provided additional insight into how that area is determined. The 80 percent value was not intended to be a hard and fast threshold, but instead to be a general level of economic activity that would serve as the socioeconomic area of most interest. The staff revised the language of Section 2.4 of the RG.*

**Comment:** Chapter 2, Section 2.4, Socioeconomics. Section 2.4 is explicit on how to analyze trends of demographic data and when the data analysis should begin and end (analyzing two decennial censuses past and extend forward to at least one past the expected license period of the proposed project). With respect to section 2.4.2, the draft guidance is less explicit but still requests for trend data.

Clarify the level of data (qualitative or quantitative) that applicants should provide for the three bullets on page 39 that will meet staff expectations. **(NEI-40 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with this comment. The expectations for the level of trend detail for the economic description of the region and for its demographic characteristics are different. The staff revised Section 2.4.2 to explain that trend data should be of sufficient depth and scope to provide an accurate account of the changes in the region's economic history, and an indication as to where those changes are most likely leading the region's economy.*

**Comment:** Chapter 4, Section 4.4.3 and Chapter 5, Section 5.4.3: Section 4.4.3 and 5.4.3 requests the applicant to utilize industry standard input-output models to quantify the benefits to the community. The guidance suggests expected direct and indirect employment effects and direct and indirect income effects.

Recommend that the guidance allow for other benefits be allowed to be discussed that can be calculated using input-output models such as output, consumption, housing prices, etc. These benefits can then be carried forward to the benefit- cost balance in Chapter 10. **(NEI-49 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with this comment. The information provided in RG 4.2 is not intended to be used as an exhaustive list of requirements for an ER. The applicant may include whatever analyses it believes are important, provided such decisions are explained in the text and the ER contains all of the analyses and data that are sufficient for the staff to conduct an independent review and verification of the information in the ER and, ultimately, to develop its own EIS. No change was made to the RG based on this comment.*

### **Comments Concerning Environmental Justice**

**Comment:** Environmental Justice, page 41: EPA recommends including the following tools/guidance to assist with the Environmental Justice (EJ) review/analysis:

PROMISING PRACTICES:

[https://www.epa.gov/sites/production/files/2016-08/documents/nepa\\_promising\\_practices\\_document\\_2016.pdf](https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf)

EJ SCREEN LINK:

<https://www.epa.gov/ejscreen> **(EPA-4 [Tomiak, Robert])**

**Response:** *The NRC agrees with the comment and has added these references to Section 2.5.1 of the RG.*

**Comment:** Chapter 2, Section 2.5, Environmental Justice: Staff is basing their methodology for performing Environmental Justice reviews through an office instruction. Office instructions can be changed internally and are meant to be desk guides for the staff.

Staff should cite either the ESRP or ISG or other guidance documents that require public participation. There also appears to be two cited office instructions, "LIC-203, Rev 2" in Section 2.5 and "LIC-203, Rev 3." in Section 2.5.1. This editorial mistake should be corrected. (Rev. 3 is cited in the References) **(NEI-41 [Ashkeboussi, Nima])**

**Response:** *The NRC understands this comment. Under Executive Order (EO) 12898 (59 FR 7629), Federal agencies are responsible for identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental impacts on minority and low-income populations. Independent agencies, such as the NRC, are not bound by the terms of EO 12898 but are, as stated in paragraph 6-604 of the executive order, “requested to comply with the provisions of [the] order.” In 2004, the Commission issued the agency’s “Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions” (69 FR 52040), which states, “The Commission is committed to the general goals set forth in EO 12898, and strives to meet those goals as part of its NEPA review process.” The NRC follows its guidance in NUREG-1555, which is based on the NRR guidance LIC-203: Procedural Guidance for Preparing Categorical Exclusions, Environmental Assessments, and Considering Environmental Issues (see ADAMS ML12234A708). NUREG-1555 is consistent with the Commission’s Policy Statement. The staff corrected the error, changing the LIC-203 discussion to the more relevant NUREG-1555 and updated the accession number in the RG accordingly.*

### **Comments Concerning Historic and Cultural Resources**

**Comment:** Chapter 2, Section 2.6.3 Consultation: The DG discusses requirements for summarizing “informal consultations,” but it is not clear whether the usage of “informal” and “formal” is intended to be the same as used in Appendix B, Sec. B.1 (pg B-1). Correspondence with the SHPO and affected tribes, for example, might not be considered “informal” from the information presented in this section. Clarify use of “informal” and documentation expectations for such consultations. **(NEI-42 [Ashkeboussi, Nimal])**

**Comment:** NRC should clarify that it is not formally delegating the initiation of Section 106 to the applicant pursuant to 36 C.F.R. §800.2(c)(4) of the Section 106 regulations. Rather, in this guidance NRC is encouraging the applicant to consult with appropriate State Historic Preservation Officers, Tribal Historic Preservation Officers, Indian tribes, Native Hawaiian organizations, local governments, and other stakeholders in order to carry out appropriate research to identify historic properties that may be affected by a proposed undertaking. NRC retains the responsibility to formally initiate the Section 106 review with all such parties and make the formal findings and determinations required by the Section 106 regulations. The applicant is carrying out the research regarding historic and cultural resources in order to assist NRC’s Section 106 review. This additional information can be included in the Historic and Cultural Resources sections of the Regulatory Guidance (Section 2.6 Historic and Cultural Resources, Page 45; Section 4.6 Historic and Cultural Resources, Page 72; Section 5.6 Historic and Cultural Resources, Page 91; and Appendix B.3 National Historic Preservation Act, Page B-2). **(ACHP-1 [Dwin Vaughn, Charlene])**

**Response:** *The NRC understands the comments and has modified the text in Section 2.6.3 to state that an applicant should engage rather than consult with the State Historic Preservation Officer (SHPO), American Indian Tribes, and interested parties in developing its ER. As a Federal agency, the NRC is responsible for consulting under Section 106 of the National Historic Preservation Act (NHPA). The information presented in Appendix B, Sections B.1 and B.3, provides the basis for the information that the NRC will need to complete consultations under the NHPA.*

**Comment:** NRC should add that properties of religious and cultural significance to Indian tribes and Native Hawaiian organizations may be eligible for inclusion in the National Register of Historic Places (54 § U.S.C. 302706). NRC should note that the Section 106 regulations specify that Indian tribes and Native Hawaiian organizations possess special expertise in assessing the eligibility of such properties (sic) (36 C.F.R. § 800.4(c)(1)). NRC should explain that often these properties of religious and cultural significance are located on ancestral, aboriginal, or ceded lands of Indian tribes and Native Hawaiian organizations (36 C.F.R. § 800.2(c)(2)(ii)(D)). However, regardless of the location of such properties,

NRC is required to consult with any Indian tribe or Native Hawaiian organization that may ascribe religious or cultural significance to a property that may be affected by an undertaking. This additional information will provide the applicant a better understanding concerning the federal agency's Section 106 responsibilities in identifying and evaluating these types of properties. This additional information can be included in the Historic and Cultural Resources sections of the Regulatory Guidance (Section 2.6 Historic and Cultural Resources, Page 45; Section 4.6 Historic and Cultural Resources, Page 72; and Section 5.6 Historic and Cultural Resources, Page 91). (ACHP-2 [Dwin Vaughn, Charlene])

**Response:** *The NRC staff agrees with this comment and has clarified the text within Section 2.6 to acknowledge NRC's responsibility to consult with American Indian Tribes that attach religious and cultural significance to historic properties.*

**Comment:** The ACHP recommends clarifying NRC's government-to-government relationship with federally recognized Indian tribes. It is important to remind the applicant that such Indian tribes are sovereign nations, their relationship with the federal agency exists on a government-to-government basis, and the NRC is responsible for its government to government relationships with Indian tribes. Consultation with an Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes. In January 2017, the NRC published its first Tribal Policy Statement and affirmed its commitment to this government-to-government relationship. If the applicant is corresponding with Indian tribes before the NRC initiates government-to-government consultation, then the applicant should clarify to the Indian tribes that the NRC will be initiating and conducting government-to- government consultation at a later date for the project. A federally recognized Indian tribe is not obligated to consult with an applicant or share information about properties of religious and cultural significance with an applicant. A federally recognized tribe may prefer to communicate directly with NRC at the government-to-government level. This additional information can be included in Chapter C Staff Regulatory Guidance and in Appendix B of the Regulatory Guidance (Section C.11 Consultations and Coordinations, Page 18; and Appendix B.3 National Historic Preservation Act, Page B-2). (ACHP-3 [Dwin Vaughn, Charlene])

**Comment:** Regarding Section 106 consultation with Indian tribes and Native Hawaiian organizations, the ACHP recommends adding that consultation will be initiated by an NRC agency official. As defined in 36 C.F.R. § 800.2(a) of our regulations, an agency official is someone who has jurisdiction over the undertaking and takes legal and financial responsibility for the Section 106 compliance. This additional information can be included in the Historic and Cultural Resources and Appendix B sections of the Regulatory Guidance (Section 2.6 Historic and Cultural Resources, Page 45; Section 4.6 Historic and Cultural Resources, Page 72; Section 5.6 Historic and Cultural Resources, Page 91; Appendix B.3 National Historic Preservation Act, Page B-2). (ACHP-4 [Dwin Vaughn, Charlene])

**Response:** *The NRC understands the comments. As a Federal agency, the NRC recognizes its responsibility to formally initiate the Section 106 review with all such parties, and make the formal findings and determinations required by the Section 106 regulations, as well as its government-to-government responsibilities. Clarifying text was added to Section 2.6 and Appendix B, Sec. B.3.*

### **Comments Concerning Air Resources**

**Comment:** Chapter 2, Section 2.7.2 Air Quality: The last bullet discusses Attachment 1 to COL/ESP-ISG-26. The status of this ISG is unclear. See 78 FR 56750; 78 FR 68101 (reopening of comment period); and 79 FR 52373. See also August 25, 2014 ISG which is marked as "Final". [ML14092A402]) Provide status of this ISG moving forward. (NEI-43 [Ashkeboussi, Nimal])



**Response:** *The NRC understands the comment. The guidance in the COL/ESP-ISG-026 as it relates to information that applicants should include in an ER was incorporated into this RG, as appropriate. The entirety of interim staff guidance in ISG-026 and ISG-027 will be terminated when it is incorporated into permanent staff guidance in NUREG-1555.*

### **Comments Concerning Nonradiological Health**

**Comment:** Chapter 2, Section 2.8.4 Electromagnetic Fields and Chapter 5, Section 5.8.4 Chronic Effects of Electromagnetic Fields: According to the EPA, “In the United States, there are no federal standards limiting electromagnetic fields from power lines and other sources to people at work or home.” What is the regulatory basis for requiring an assessment of “acute effects from exposure” or “long-term or chronic exposure” to such fields, or implying an adverse impact in light of the lack of objective evidence linking exposure to such impacts? What guidance is available for meeting the requirements set forth in this section of the DG?

NUREG-1437 states repeatedly that no conclusive evidence has been presented identifying such exposure as hazardous. It is not appropriate, therefore, either to imply such hazards exist (as inclusion of its assessment under “non-radiological health” does), or to saddle applicants with the ongoing burden and uncertainty of continuing to have to prove a negative.

Sections 2.8.4 and 5.8.4 should be deleted from this DG. Assessment of electromagnetic fields should not be required until/unless definitive evidence of a hazard is provided. **(NEI-44 [Ashkeboussi, Nima])**

**Response:** *There have been multiple studies linking electromagnetic fields from transmission lines to health effects and multiple studies showing no linkage. At this point, there is no conclusive evidence on which the staff can rely to definitively state that such fields do or do not result in health effects. These health effects have been studied for several years and were evaluated in NUREG-1437, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants,” Initial, and Revision 1.*

*This situation is reflected in 10 CFR Part 51, Subpart A, Appendix B, Table B-1, where this issue was retained for license renewal environmental reviews without being defined as either Category 1 or 2. The applicant should review and report whether there is any new information regarding whether a consensus has been reached by the appropriate Federal health agencies pertaining to the effects of long-term or chronic exposure to EMFs. This information is requested to satisfy the requirement in 10 CFR 51.41 to provide the information the staff needs for its analysis, and is not intended to involve an onerous search of studies. Rather, the applicant need only report whether the appropriate Federal health agencies have reached a consensus. The text in Sections 2.8.4 and 5.8.4 was revised in response to this comment.*

**Comment:** Chapter 5, Section 5.8.3 Acute Effects of Electromagnetic Fields - Clarify that this section is more concerned with electric shock than “exposure to EM fields” by amending the section title. Change title to “Electric Shock Impacts.” **(NEI-51 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with this comment and has modified the title in Section 5.8.3 to reflect the contents of this section of the guidance. The types of shocks considered include both those from direct contact with transmission lines, and those induced by electromagnetic fields.*

### **Comments Concerning Radiological Health and Waste Management**

**Comment:** Chapter 2, Section 2.9 Radiological Environment and Radiological Monitoring and Chapter 5, Section 5.9.6 Radiological Monitoring: The DG describes requirements for a greenfield site only in these two sections. Are there other areas where greenfield considerations are important?

Clarify where/whether greenfield considerations are relevant to other sections to distinguish environmental data requirements for licensing of expansions on existing plant sites versus on greenfield sites. **(NEI-45 [Ashkeboussi, Nima])**

**Response:** *The term “greenfield” in the context of Sections 2.9 and 5.9.6 refers to land that has not had an operating, permanently shutdown, or nonoperating nuclear reactor. Because it is not used in other sections of the RG, the term “greenfield” has been removed and replaced with language describing this condition.*

**Comment:** Chapter 2, Section 2.9 Radiological Environment and Radiological Monitoring: The 5th bullet mentions NEI 07-07. As described in the NEI transmittal, this industry guidance document is “a voluntary initiative on ground water protection. The purpose of the initiative is to improve nuclear industry programs for preventing, detecting and responding to inadvertent releases of radioactive substances that may result in low but detectable levels of plant-related materials in ground water. Such releases are well below the NRC’s limits to ensure protection of public health and safety and fall outside the scope of specific regulatory requirements.”

Industry initiatives that fall outside the scope of NRC requirements should not be drawn into a formal RG. **(NEI-46 [Ashkeboussi, Nima])**

**Response:** *The NRC disagrees with this comment. The RG states that “to the extent the information is available, the ER should include the following information.” Knowing whether the applicant has an implemented groundwater protection program in place for a co-located licensed facility or plans to initiate a groundwater protection program is necessary for NRC to conduct a comprehensive analysis. No change was made to the RG based on this comment.*

**Comment:** Chapter 4, Section 4.9: Refers to “multi-modular reactors” – but this term is not well defined. Clarify or define the term of multi-modular reactor, to distinguish from modular construction terms. **(NEI-50 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with the comment, has revised the terminology in Section 4.9 of the RG, and has eliminated the use of “modules and modular.”*

**Comment:** Chapter 5. Section 5.9 Radiological Health during Normal Operation: The text should be expanded beyond that of “radiological sources from operation of the proposed facility” to include potential radiological sources from co-located facilities, such as existing coal piles or coal slurry ponds (for re- powering projects) or other industrial uses. Revise to account for other radiological sources potentially on the site. **(NEI-52 [Ashkeboussi, Nima])**

**Response:** *The NRC disagrees with this comment. In this section, the NRC is only analyzing the radiological health impacts from the proposed operating reactor(s) and potentially other co-located NRC-licensed facilities. In the cumulative impacts chapter, the NRC would assess any past, present and reasonably foreseeable future actions that may contribute to radiological health impacts. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.9.3 Impacts to Members of the Public: The last paragraph references an NRCP [sic] report (reference 68). That reference is to “National Council on Radiation Protection and Measurements (NCRP), 2009, “Ionizing Radiation Exposure of the Population of the United States,” NCRP Report No. 160, Bethesda, MD,” which summarizes 2006 data. Is there more recent data available? Provide updated report, if there is one available. **(NEI-53 [Ashkeboussi, Nima])**

**Response:** *At the time of publication of the RG, NCRP will not have updated the data in Report 160. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.9.4, Occupational Dose to Workers: Sentence “This value can either be estimated from the design control document (DCD) for the reactor design or from doses to workers at operational units at the site.” Only applies if the plant is licensed under Part 52, however if the plant is licensed under Part 50, the PSAR/FSAR is the source of information. Revise to include PSAR/FSAR for plants that are licensed under Part 50. **(NEI-54 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees with the comment and has added a reference to the Preliminary Safety Analysis Report (PSAR)/Final Safety Analysis Report (FSAR) in Section 5.9.4.*

**Comment:** 2015 Underground Storage Tank (UST) Regulations: EPA recently revised its UST regulations (<https://www.epa.gov/ust/revising-underground-storage-tank-regulations-revisions-existing-requirements-and-new>). This information may be useful to the applicants for any storage tank discussions during the development of their environmental reports. **(EPA-9 [Tomiak, Robert])**

**Response:** *Although the information proposed by EPA may be useful, the NRC does not explicitly address underground storage tanks in the RG and therefore will not include the Web site in the RG. No change was made to the RG based on this comment.*

#### **Comments Concerning Nonradioactive Waste Management**

**Comment:** Chapter 5, Section 5.10 Nonradioactive Waste: The list of wastes here is more comprehensive than the similar list in Section 4.10 although most wastes are the same during construction and operation differing mainly in volume. Suggest that the lists of wastes to be addressed be consistent in both sections. **(NEI-55 [Ashkeboussi, Nima])**

**Response:** *The NRC agrees in part with the comment. Many of the wastes generated during building and during operations are similar. But the lists are not meant to be comprehensive. Rather, they describe “the types of nonradioactive waste” that might be generated during building or operation. In general, the differences in the lists are associated with the different types of activities occurring when the plant is being built versus operated. For example, cleared vegetation and spoils, listed in Section 4.10, are common wastes during building, and less so during operations. No change was made to the RG based on this comment.*

#### **Comments Concerning Environmental Impacts of Postulated Accidents**

**Comment:** Chapter 5, Section 5.11, para. 1: Section 5.11 states, “The applicant’s evaluation should be performed in accordance with the current version of NRC guidance documents.”

These evaluations take a significant amount of time to develop, revise, and maintain. Applicants should have some window of time to assure the evaluation does not need to be re-performed when new NRC guidance comes out just prior to the submittal/docketing/approval of their application.

Change to “The applicant’s evaluation should be performed in accordance with the latest version of NRC guidance documents available 18 months prior to submittal of their application” to allow time to prepare the application. **(NEI-56 [Ashkeboussi, Nima])**

**Response:** *The NRC staff understands the comment. Per 10 CFR 51.40, the applicant should consult with the NRC “as early as possible” through pre-application discussions before submitting environmental information or filing an ER. During these discussions, the applicant can obtain clarification as to the nature of the NRC guidance documents that should be used in the application. These discussions would provide the NRC staff the opportunity to discuss revisions to guidance that may affect the applicant’s analysis to manage and lessen the burden on the applicant. This RG cannot assign a general cut-off date of, for example, 18-months, that would meet the regulatory requirements of 10 CFR Part 51 in all cases. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.11, Para. 1 and Section 5.11.2, para. 2 - Section 5.11 states, “The evaluation should be generic for design certifications...” and Section 5.11.2 states, “The environmental risks of severe accidents (i.e., Level 3 PRA) should consider all severe accident types from the Level 1 PRA, apply all source terms from the Level 2 PRA, and should be generic for DCs and site-specific for all other applications.”

What does it mean to do a generic evaluation when many inputs are of a site specific nature? What is generic weather, land use, watershed, crops, population distributions, etc.? In the past, design certification applicants have selected previously constructed sites to gather generic values which resulted in questions asking for evidence as to why the site over a specific time period is representative or generic (for example, RAI No.: ER 1-8428 from APR1400 design certification). These RAIs on generic site specific values have taken the industry significant time and resources to address.

Provide guidance as to what will be accepted as “generic” site specific inputs for design certification evaluations. (NEI-57 [Ashkeboussi, Nimal])

**Response:** *The NRC staff understands the comment. To address the comment concerning the term “generic evaluation,” the NRC staff modified the text in Section 5.11 to remove the discussion of a generic evaluation for standard design certification (DC) applications. Rather, text for the evaluation of severe accidents and severe accident mitigation design alternatives is discussed in Appendix A, Section A.5 for standard DC licensing actions.*

*Regarding the term “generic” for a standard DC application, offsite radiological and economic consequence analyses (i.e., a Level 3 probabilistic risk assessment (PRA)) based on site information is a necessary part of the environmental assessment for Severe Accident Mitigation Design Alternatives (SAMDA). Because the DC licensing action is not necessarily tied to a specific site, the DC applicant will need to develop surrogate or representative site data (e.g., population distribution, meteorological data, land use data, etc.). The applicant has the flexibility to choose a source for this surrogate or representative site data, which may or may not rely on real site data and could be based on “generic” information from a survey of known sites. For example, the ESBWR ER relied upon an offsite consequence analysis “...in conjunction with generic site data in the EPRI Utility Requirements Document...” (GE Hitachi Nuclear Energy, “Clarification of SAMDA Screening Process in NEDO-33306,” Revision 4, October 25, 2010, Wilmington, NC. ADAMS Accession No. ML102990433 emphasis added). Another DC application stated “...the Level 3 PRA uses realistic site data for evaluation of consequences.” (Areva NP Inc., “U.S. EPR Probabilistic Risk Assessment Methods Report,” ANP-10274NP, Revision 0, December 2006, Lynchburg, VA. (ADAMS Accession No. ML063540121 emphasis added)).*

*To ensure clarity on severe accident methodology and its application, the NRC encourages potential applicants to confer with the NRC staff as early as possible in their planning process in accordance with 10 CFR 51.40 to address unique characteristics of their design and for clarification on NRC guidance.*

**Comment:** Chapter 5, Section 5.11.1, first bullet: The paragraph has an odd number of parentheses. Add a closed parenthesis or otherwise fix typographical error. (NEI-58 [Ashkeboussi, Nima])

**Response:** *NRC agrees with the comment and corrected the typographical error in Section 5.11.1 of the RG.*

**Comment:** Chapter 5, Section 5.11.1: Criteria are called out here: “comparison of the DBA doses with review criteria given in regulations (i.e., 10 CFR 52.79(a)(1), and 10 CFR 100.21, “Non-Seismic Siting Criteria”) and standard review plans (i.e., SRP criteria, Table 1 in SRP Section 15.0.3 of NUREG-0800, Ref. 57).” However it is understood that 10CFR50.34 and RG1.183 are the prevailing regulatory references for dose criteria for DBAs. Revise to ensure that correct regulations for DBA dose criteria are called out. (NEI-59 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with the comment and has made changes to the second to last bullet under Section 5.11.1 to address this comment. The following are the applicable regulations.*

- *10 CFR 50.34(a)(1) – applicable to safety analysis requirements for 10 CFR Part 50 Construction Permit (CP) and COL*
- *10 CFR 52.17(a)(1) – ESP safety analysis*
- *10 CFR 52.79(a)(1) – COL safety analysis*
- *The Standard Review Plan (NUREG-0800) and RG 1.183 as guidance are applicable to light-water reactors.*

**Comment:** Chapter 5, Sec 5.11.2 Severe Accidents: The DG should apply risk-informed insights and NEPA’s “reasonably foreseeable” standard consistently. Where a design can demonstrate convincingly that its maximum credible (which actually exceeds “reasonably foreseeable”) event does not involve an uncovered core, there should be no obligation to deterministically assume significant core damage in postulating beyond design basis events.

Further, the DG should establish a cutoff frequency beyond which severe accident consequences – e.g.  $10^{-6}$  – need not be considered. (Requiring consideration of extremely rare events is not consistent with a “reasonably foreseeable” standard, and sends an inaccurate message to the public about the relative risks of nuclear generation.)

Develop guidance on establishing “severe accident” assumptions when core damage has been precluded above, say,  $10^{-6}$  per reactor-year. (NEI-60 [Ashkeboussi, Nima])

**Response:** *The NRC disagrees with the comment. The Commission considers risk in terms of likelihood and consequences of an event. The commenter is requesting that a core damage probability “cutoff” be established in assessing severe accidents, which would constitute a change in Commission policy. Commission policy, according to 45 FR 40101 “Nuclear Power Plant Accident Considerations under the Environmental Policy Act of 1969”, dated June 30, 1980, states that “approximately equal attention shall be given both to the probability of occurrence of releases and to the environmental consequences of releases.” The Commission did not establish a cutoff for this probability measure, and clearly stated that other considerations are pertinent to the assessment. Namely,*

*“The environmental consequences of releases whose probability of occurrence has been estimated shall also be discussed in probabilistic terms. Such consequences shall be characterized in terms of potential radiological exposures to individuals, to population groups, and, where applicable, to biota. Health and safety risks that may be associated with exposures to*

*people shall be discussed in a manner that fairly reflects the current state of knowledge regarding such risks. Socioeconomic impacts that might be associated with emergency measures during or following an accident should also be discussed.”*

*The court in Limerick Ecology Action Inc. v U.S. Nuclear Regulatory Commission, 869 F.2d 719 (1989) described the calculation of risk as follows:*

*“Moreover, as a logical proposition, because risk equals the likelihood of an occurrence times the severity of the consequences, see Baltimore Gas, 462 U.S. at 104–05, 103 S.Ct. at 2255–56 (quoting NUREG–0116 at 2–11), even assuming that all plants are of exactly equal design and construction, which they obviously are not, the risk will vary with the potential consequences.’*

*And*

*“As the NRC itself has noted, ‘the population distribution in the vicinity of the site affects the magnitude and location of potential consequences from radiation releases.’”*

*The NRC recognizes there has been improvements in the state-of-art for assessing the probability of severe accidents using PRAs. Current guidance and standards regarding PRAs are found in the Commission Policy Statement, "The Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities" (60 FR 42622), Chapter 19 of NUREG-0800, Standard Review Plan, RG 1.174, RG 1.200, and American Society of Mechanical Engineers (ASME) PRA Standards endorsed by the NRC, such as ASME/ANS RA--Sb-2009. However, the current practice of PRAs does not change the direction to the staff from the previously cited Commission Policy Statement where risk is an assessment of both the probability and the consequence.*

*The NRC encourages potential applicants to confer with the NRC staff as early as possible in their planning process in accordance with 10 CFR 51.40 to address unique characteristics of their design and for clarification on NRC guidance. No changes were made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.11.2 Severe Accidents: The discussion of Level 1/2/3 PRAs is specific to large LWRs and has no comparable meaning with advanced non-LWRs.

Note, Appendix C Small Modular Reactor Design does describe some differences between large and small reactors. The discussion presented in the Appendix, while useful, does not address technology differences between small water-cooled designs (SMRs) and advanced non-LWRs. The RG should address technology differences between (SMRs) and advanced non-LWRs. **(NEI-61 [Ashkeboussi, Nima])**

**Response:** *The NRC staff understands the comment and has modified the text in Section 5.11.3 to be applicable to COLs. Additionally, staff has modified Appendix A to clarify what an applicant needs to consider for evaluations required under other licensing actions. For Appendix C, the text has been modified to state that most of the guidance contained within the RG could be used for non-LWRs. Exceptions would include areas such as accidents, fuel cycle, transportation of radioactive materials, and decommissioning.*

**Comment:** Chapter 5, Section 5.11.2 Severe Accidents: The 3rd bullet should append the listing of “NUREG/CR- 6613, “Code Manual for MACCS 2: Volume 1, Users Guide,” MELCOR Accident Consequence Code System (MACCS2 code)” with “or equivalent” as MELCOR was developed specifically for large LWRs and may not be appropriate for use with advanced non-LWRs. Similar comment on other references to PRA within the draft. Revise guidance to clarify alternative options to MELCOR code. **(NEI-62 [Ashkeboussi, Nima])**

**Response:** *The NRC staff disagrees with the comment. Although the commenter states that they request “revise[d] guidance to clarify alternative options to MELCOR code,” the segment of the 3<sup>rd</sup> bullet mentioned in the comment is in fact referring to the application of the latest publicly released version of the MACCS code package, which has been predominantly used in new reactor applications to date. The RG is guidance and does not restrict an applicant to a specific computer code package or methodology. In fact, any computer code package or methodology presented in the RG is one that the NRC has successfully applied in past environmental reviews. Therefore, consistent with NRC’s guidance, alternative methodologies or tools are acceptable for use with justification for their application and where appropriately documented for the NRC staff’s review. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.11.2, para. 3 - Section 5.11.2 states, “The risks should be estimated using an acceptable methodology that uses onsite and regional meteorology, population, and land-use data.” This section does not explicitly elaborate on what would be considered an acceptable methodology. Provide explicit guidance as to what would be considered an acceptable methodology or clarify that applicants may use other final guidance for interactions between the applicant and staff. **(NEI-63 [Ashkeboussi, Nima])**

**Response:** *The NRC staff understands the comment. Chapter 2 of the RG discusses the acceptable methodology for defining meteorology, population and land-use expectations in the ER. Also, the NRC-maintained “Sector Population and Economic Factor” (SECPOP) code package (NUREG/CR-6525, Rev. 1) is an acceptable methodology that incorporates onsite, local and regional data into risk estimations and can be used directly in the MACCS code package. Applicants can apply other computer code packages or other information sources as long as they are appropriately and rationally justified in the ER. The first sentence in Section 5.11.2, paragraph 3 will be revised as follows: “The ER should estimate the risks applying an acceptable methodology that uses onsite and regional meteorology, population, and land-use data (see Chapter 2 of this RG for relevant site-specific meteorological, population and land-use guidance).” Potential applicants should engage the NRC staff under 10 CFR 51.40 if further clarification is needed on this topic.*

**Comment:** Chapter 5, Section 5.11.2, para. 3, second bullet: Section 5.11.2 states, “The applicant should provide... list of severe accident release sequences and their associated core damage frequencies from the Level 1 PRA and source terms for internally initiated events, fire events, flooding events, low power and shutdown events, and externally initiated events (e.g., high winds and earthquakes) as determined from the Level 2 PRA”.

Design Certification Applications are not required to have a seismic PRA and COLAs are not required to have a seismic PRA until first fuel loading. Furthermore, it is difficult for an applicant to provide this information without a "generic" seismic hazard curve for the US in absence of site specific information in a DCA.

Provide exception to this expectation to provide source terms induced by earthquakes for design certification applications, or otherwise qualify the statement or provide guidance on how COLAs and DCAs are to fulfill this expectation. **(NEI-64 [Ashkeboussi, Nima])**

**Response:** *The NRC staff agrees with the comment. The commenter suggests improving consistency between PRAs and the application of the ER. Therefore, the staff revised the text in Section 5.11.2 to say: “...externally initiated events as are appropriate for the application (e.g., high winds and other external hazards)...”.*

**Comment:** Chapter 5, Section 5.11.2, para. 3, third bullet: Section 5.11.2 states, “The applicant should provide... description of the methodology in NUREG/CR-6613”. NUREG/CR-6613 is not a methodology document per se. It is unclear what methodologies from NUREG/CR-6613 Section 5.11.2 is requesting. Assuming the guidance is updated to clarify this specifically, it is then unclear why each applicant should redundantly duplicate and transcribe portions of NUREG/CR-6613 into their application instead of simply stating certain methodologies from certain portions of the NUREG were utilized. NUREG/CR-4551 provides methodology. Should it have been mentioned in this bullet?

Clarify what methodology in NUREG/CR-6613 is being referred to and do not request applicants to duplicate descriptions of methodologies in their applications if the methodologies are already referenceable in the NUREG itself. **(NEI-65 [Ashkeboussi, Nima])**

**Response:** *NRC staff understands the comment and has revised the text in Section 5.11.2 to clarify that NUREG/CR-6613 is not a reference on the methodology that could be applied, rather as the user guide for MACCS, as follows:*

- *description of the methodology used to estimate site-specific severe accident risks (i.e., Level 3 PRA), including the computer code(s) to be used in the analyses, such as MELCOR Accident Consequence Code System (MACCS) code package (see NUREG/CR-6613, “Code Manual for MACCS2: User’s Guide,” Volume 1*

*In regards to NUREG/CR-4551, this RG does not restrict an applicant to a specific methodology or computer code. Thus, a reference to prior NRC documents on severe accident methodology is not cited in the RG due to the potential to be revised in the future. The commenter is correct that NUREG/CR-4551 document series provides the methodology and also MACCS input parameter value guidance. However, this was for a past NRC severe accident study provided in NUREG-1150. There is also a more recent severe accident study, State-of-the-Art Reactor Consequence Analyses (SOARCA), with documentation on this study’s methodology and application of the MACCS code package. Therefore, because there are at least two sources of information on methodology, applicants should ensure the methodology applied is properly described and referenced in the ER. Since improvements to MACCS and the accompanying guidance could occur, applicants should ensure that the current version of guidance for the MACCS code package or alternative code(s) is properly described and referenced in the ER.*

**Comment:** Chapter 5, Section 5.11.2, para. 3, sixth bullet - Section 5.11.2 states, “The applicant should provide... description of the demographic and population data used in the analysis based on the 50-mi population estimate for the year operation is expected to cease”.

NEI 05-01 recommends the population estimate be for a year in the second half of the period of extended operation. An estimate closer to a median date of operation will typically be more realistic compared to an end-of-operation date-based estimate (since population typically grows with time, but the hypothetical accident could occur at any time in the plant’s life). Additionally, from a practical standpoint for design certifications, an estimate looking 60 or 80 years into the future demographic and population is less reliable and harder to obtain than an estimate looking 20 or 40 years into the future.

Recommend maintaining the NEI 05-01 guidance, or otherwise provide guidance that is closer to a median year of plant lifetime based estimate rather than an estimate for the year operation is expected to cease. **(NEI-67 [Ashkeboussi, Nima])**

**Response:** *The NRC understands the comment. Demographic data applied for the evaluation of severe accidents are based on the data presented in ER Section 2.4.1, “Demographics,” and consistently applied throughout the ER. Assessments are made over the timeframe of the Federal action applying the best*



*available population information. For previous new reactor reviews, the timeframe has been the initial license period of 40 years with one extension of 20 years for a license renewal. This timeframe results in the population and demographics to be extrapolated to the maximum extent possible into the future far greater than the median year of a proposed license renewal timeframe. Previous COL applicants have been able to apply such a timeframe for their new reactor application or to fully explain the selected timeframe. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.11.2, para. 3, twelfth bullet: Section 5.11.2 states, “The applicant should provide... description of the comparison of the core damage frequencies estimated for the reactor to those for current- generation reactors and the comparison of the population dose risks to the mean and median values for current- generation reactors undergoing license renewal”.

What is the practical benefit or necessity of giving this comparison? If the staff still find this request necessary, it would be beneficial for them to provide a reference document that will be periodically updated that contains the average CDF and dose risks from current-generation reactors. Otherwise, many applicants could choose a variety of different reactors they deem as representative to compare against, which could lead to inconsistencies and significant time spent by applicants assembling this data and assuring it is what the staff wants.

Rescind the expectation to provide a comparison of the applicant’s reactor against current-generation reactors. If not rescinded, provide applicants with guidance (preferably an easily referenceable table of data) describing the current-generation reactor data. **(NEI-68 [Ashkeboussi, Nima])**

**Response:** *The NRC staff disagrees with the comment. The Section 5.11.2 text cited by the commenter is consistent with Commission policy which states “The environmental risk of accidents should also be compared to and contrasted with radiological risks associated with normal and anticipated operational releases” (45 FR 40101). There are several publicly available sources from the current-generation reactors where data are available (e.g., annual radiological reports, license renewal documents) and it is dependent on the applicant to incorporate the available data into its ER. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.11.2, para. 3, thirteenth bullet: Section 5.11.2 states, “The applicant should provide... description of individual (i.e., early fatality and latent cancer) risks”.

Are estimates of latent cancer from low-probability events required for NEPA? It is understood that the council on environmental quality (CEQ)'s regulations implementing NEPA have a complex legal history with respect to interpretations, but the precise reason for the requested level of detail desired by NRC for early fatality and latent cancer estimates from severe accidents should be given if other agencies regulating competing energy industries do not require similar levels of detail in their NEPA analyses. For example, in *Warm Springs Dam Task Force v. Gribble* in 1980, the Ninth Circuit Court of Appeals found that a discussion of the consequences of a dam failure (i.e., a low probability high consequence event akin to a severe accident) was unnecessary, stating, “Everyone recognizes the catastrophic results of the failure of a dam; to detail these results would serve no useful purpose.” At issue is that if oil pipelines and solar cell manufacturing complexes are including estimates of how many cancers may occur from hypothetical oil spills and hazardous waste spills, then it would be proper for the nuclear industry to follow suit. However, if the oil, coal, and solar industries are not discussing latent cancer effects in their NEPA related documents then it would be unfair and projecting a false image to the public of the relative risks of nuclear power for nuclear power related EIS's to discuss cancer effects when it is reasonable to speculate that similar cancer risks exist for other forms of energy.

If offsite dose from low probability high consequence events are already requested and NUREG/1530 \$/REM values already implicitly take into account consequences from early fatality and latent cancer effects, then the general intent of the request may already be met without explicitly listing the number of estimated early fatalities and latent cancers.

Also, various computer codes may be used that implement various health physics models (threshold vs linear no- threshold) to estimate latent cancer risk and it may be possible for applicant's methods to be valid, but not consistent with assumptions implicit in other health effect related guidance (such as NUREG/1530).

Rescind the expectation to provide early fatality and latent cancer risks from low probability high consequence severe accidents. If not rescinded, provide a specific basis for the request. If not rescinded, provide explicit guidance as to what methods would be acceptable for the calculation of the number of early fatalities and latent cancers. **(NEI-69 [Ashkeboussi, Nima])**

**Response:** *The NRC disagrees with the comment. The full text of concern to the commenter is as follows:*

- *description of individual (i.e., early fatality and latent cancer) risks and population dose risks from severe accidents; these risks should be compared to the Commission's Safety Goals (51 FR 30028) and with dose risks from routine and anticipated operational releases.*

*The staff uses this information to assist in developing a sufficient basis for impact conclusions in the EIS. Comparing the individual early fatality and latent cancer risks to the Commission's Safety Goals helps to determine if the environmental risk from the proposed licensing action is lower than the safety goal. This assessment forms one part of the staff's independent evaluation based on the rationale that the environmental impact would be small if the individual's risks are less than the safety goal. Please note the individual early fatality and latent cancer information consists of output parameters that can be directly extracted from the offsite consequence analysis performed by the MACCS code. No change was made to the RG based on this comment.*

**Comment:** Chapter 5, Section 5.11.3, para. 2, footnote 13 - Section 5.11.3 footnote 13 states, "NEI 05-01... provides a template for completing SAMA analysis in support of reactor license renewal. If applied as a guidance document for new reactor applications, the applicant should justify its use in the ER".

NEI 05-01 has been applied as a guidance document for new reactors in the past successfully. What particular portions of NEI 05-01 does the staff believe are inapplicable to use as a template for new reactor applications? It seems imprudent, and potentially confusing, to request each applicant to re-justify the use of this SAMA guidance document when alternative guidance documents are not recommended or existent.

Clarify the ways in which the staff perceives NEI 05-01 could be used in an improper manner when applied to new reactor applications, or rescind the request that NEI 05-01 be re-justified by every new reactor applicant. **(NEI-70 [Ashkeboussi, Nima])**

**Response:** *NRC disagrees with the comment. While NEI 05-01 contains useful information, such as Section 4, based on NUREG/BR--0184, "Regulatory Analysis Technical Evaluation Handbook," and Sections 5 through 8, concerning the identification, assessment, and screening of severe accident mitigation alternatives (SAMAs), the NRC has only endorsed this guidance for license renewal SAMAs. NEI 05-01 makes no statement for its applicability to 10 CFR Part 52 licensing actions. While previous new reactor applicants have applied the methodology in NEI 05-01, the staff has found its implementation*

for these licensing actions problematic, especially in regards to PRA information and in regards to bases and assumptions for some cost benefit formulas provided in NEI 05-01. For example:

- *There is no discussion or reference to NUREG-0800, Standard Review Plan, Chapter 19 and PRA guidance documents such as RG 1.174, RG 1.200, or American Society of Mechanical Engineers (ASME) PRA Standards endorsed by the NRC, such as ASME/ANS RA--Sb-2009.*
- *Some new reactor applicants have applied the external events multiplier presented in NEI 05-01 Section 3.1.2.4 even though their applications have a full scope PRAs with complete sets of hazard categories such as internal events, fire, flooding, low power shutdown, and external hazard accident sequences. These full scope PRAs could readily have provided appropriate source terms for all hazard categories, which could be directly applied in the MACCS code for determining a complete set of offsite consequences.*
- *There are cost parameter values applied from NUREG/BR-0184 for onsite cleanup-decontamination and replacement power costs that are based on 1993 dollars. However, the staff has found that some new reactor applicants have not adjusted these cost parameters to a current dollar value.*
- *One cost parameter value in the replacement power cost formulation is based on an average capacity factor of 60 percent to 65 percent. However, new reactor average capacity factors have been estimated to be greater than 90 percent.*

*Therefore, a new reactor applicant would need to justify the use of NEI 05-01 with relevant updated parameters since the NRC has not formally endorsed it for new reactor licensing actions. No change was made to the RG based on this comment.*

### **Comments Concerning Fuel Cycle, Transportation, and Decommissioning Impacts**

**Comment:** Chapter 6, Section 6.1.2 - Editorial: “(in gal or m3)” appears to be missing the superscript on cubic meters. Revise to use superscript on cubic meters. (NEI-71 [Ashkeboussi, Nima])

**Response:** *The NRC agrees with this comment and has corrected the error in Section 6.1.2*

**Comment:** The 2nd bullet provides an incorrect reference to COL/ESP- ISG-26 (reference 16 versus the correct reference 14). A quick review indicates that the referencing of this and other documents is incorrect for multiple entries. Correct the incorrect references and verify all references are correctly applied throughout the document. (NEI-72 [Ashkeboussi, Nima])

**Response:** *The NRC disagrees with the comment. The “16” is a footnote, not a reference. No change was made to the RG based on this comment.*

**Comment:** In section 6.3, Decommissioning, the ER report is to contain documentation to certify that sufficient funds will be available to provide for radiological decommissioning. This is an unnecessary requirement for the site-specific cost estimate must be submitted under 10 CFR 50.82(a) (8) (iii). Providing this documentation also in the ER will just ensure multiple revisions will be required to stay synchronized or different information will exist on the docket in different documents intending to report the same information. Recommend deleting this requirement. (GH-1 [Halnon, Greg])

**Response:** *Applicants for operating licenses of commercial nuclear power reactors are required to submit a report as specified in 10 CFR 50.75(b)(1) and required by 10 CFR 50.33(k)(1) that contains a certification that financial assurance for radiological decommissioning will be provided. It is acceptable to provide this certification in another section of the application and then reference the certification*

*within the ER. Section 6.3 has been revised to explain that the ER can reference the location in the application that contains the required certification.*

### **Comments Concerning Cumulative Effects**

**Comment:** NEPAssist Tool discussion, page 124: EPA recommends that NRC clarify the characterization of the NEPAssist Tool to include the following description:

Database tools such as NEPAssist may facilitate the environmental review process and project planning in relation to environmental considerations. The web-based application draws environmental data dynamically from EPA Geographic Information System databases and web services and provides immediate screening of environmental assessment indicators for a user-defined area of interest. These features contribute to a streamlined review process that potentially raises important environmental issues at the earliest stages of project development. **(EPA-6 [Tomiak, Robert])**

**Response:** *The NRC agrees with the comment and has clarified the characterization of the NEPAssist tool in the Section 7.1.*

**Comment:** Chapter 7, Section 7.0 Cumulative Impacts - This section has a good explanation of how to establish the geographic area for cumulative effects. However, the guidance provided does not comport with recent direction from the staff that the cumulative geographic area for each resource needed to match the direct/indirect geographic area. Ensure direction in the guidance is consistent with staff expectations regarding the relationship (if any) of the cumulative impacts geographic area to the direct/indirect impacts geographic area. **(NEI-73 [Ashkeboussi, Nimal])**

**Response:** *The NRC agrees with this comment and has provided more clarity in this area in Section 7.0 of the RG. The resource impact area is the area where the direct and indirect impacts to the resource occur as a result of the project. The geographic area of interest is defined as the area where other actions occur that could have direct and indirect impacts within the resource impact area. The geographic area of interest is the area used to identify other projects that could affect the resource impact area.*

### **Comments Concerning Need for Power**

**Comment:** Need for Power

Compared to the conventional large light water reactors in operation today, the power produced by small modular and advanced reactors can be used for applications other than production of electricity, such as hydrogen production, desalination, and steam production for process heat applications. NRC should not be evaluating business cases and system planning needs of applicants; rather their focus should be on reactor safety and environmental analysis. DG-4026 places an excessive requirement to consider the “need for power”, even if that is not the intended benefit of the project. Furthermore, DG-4026 seems to preclude justification of a project exclusively for greenhouse gas reduction, fuel diversity, grid stability, or mission- critical applications by referring to these as “ancillary benefits.” The National Environmental Policy Act (NEPA) does not require that an environmental impact statement consider “need for power” explicitly, but rather dictates an evaluation of the project based on a cost-benefit analysis. In light of this information, industry recommends accounting for the use of power for applications other than the production of electricity in the purpose and need statement. Such consideration would be fully compatible with the current regulations and the Commission’s continued interest in a need for power analysis, as a need for power analysis need not be limited to electrical power. These changes to DG-4026 would

accommodate the need for power analysis for types of commercial nuclear plants beyond a simple electrical power plant. (NEI-1 [Nima Ashkeboussi])

**Comment:** Chapter 8, Section 8.0 Need for Power: Consistent with the comment on Sec. 1.2, above, the DG inappropriately REQUIRES consideration of “need for power,” even if that is not the intended benefit of the project. Other uses such as desalination or other process heat applications are ignored.

Additionally, the DG seems to preclude justification of a project exclusively for greenhouse gas (GHG) reduction, fuel diversity, grid stability, or mission-critical applications by referring to these as “ancillary benefits.”

NEPA does not require that an EIS consider “need for power” explicitly, but rather dictates an evaluation of the project based on a cost-benefit analysis.

An analogous set of evaluation guidance should be developed for non-electricity production.

The staff has expressed reluctance to develop this guidance owing to a lack of stated applicant interest in non-electricity applications. However, at a minimum, the guidance should acknowledge purposes other than “need for power” and not require consideration of “need for power” in those instances.

The guidance should also restate non-baseload justifications such as GHG reduction, fuel diversity, etc., acknowledging the option that they may not be solely “ancillary benefits,” but may actually constitute a sufficient purpose and need of their own.

Conforming changes will also be needed elsewhere, e.g., in Sec. 9.2. (NEI-74 [Ashkeboussi, Nima])

**Comment:** Chapter 8, Need for Power: The need for power should consider non-electrical power applications as well (e.g., cogeneration and industrial heat). Much of the guidance in Section 8 can be applied as is, with removal or expansion of discussion specific to electrical power.

Delete reference to electricity where guidance can be applied directly to non-electrical power applications. For guidance specifically applicable to electrical power, add discussion that accommodates other types of power generation. (NEI-75 [Ashkeboussi, Nima])

**Response:** *The NRC disagrees in part and agrees in part with the comments. If the reactor will produce electricity that will be distributed via the grid, the NEPA benefits of such a traditional reactor are considered in terms of the societal need for the power (electricity) that reactor would produce. The Commission has stated repeatedly (Duke Power Co. (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397, 405 (1976), and Denial of Petition for Rulemaking (PRM 52-2) Regarding Review of Need for Power and Alternative Energy Sources in Nuclear Power Reactor Siting and Licensing Reviews September 29, 2003, 68 FR 55905)), the NRC must include a balancing of costs and benefits as part of its NEPA analysis associated with nuclear power plant licensing, and such a balancing must include the need for power. Ancillary benefits of the project can be addressed in the purpose and need and incorporated into the benefits discussion in Chapter 10 of the ER. The staff understands there is a potential for non-traditional uses—non-electricity generating uses or for generating electricity that would not or could not be connected to the grid—for power reactors (including SMRs and other advanced designs). While an application for a non-traditional power reactor is possible, the applicant for such a project should consult with the NRC staff in accordance with 10 CFR 51.40 to discuss the information and analysis that should be provided in the ER. Changing the need for the project from supplying electricity to some other commodity or use affects not only the need analysis, but also the supply and demand of that commodity or use, alternative analysis, and the cost benefit analysis. Therefore, when an*

*applicant begins the pre-application process for a reactor that will not produce electricity for the grid, staff will address the specific analytical requirements for that use during the pre-application process. Appendix C of the RG already acknowledged the potential for other purposes for a new reactor.*

**Comment:** The Commission recognized the potential tension between its regulations and guidance when considering need for power outside regulated markets. Industry continues to believe that further revisions to DG-4026 will likely be necessary to address the following issues:

- Previous industry letters discussed the limitations of analyzing the need for power within a defined service area and the associated need for power analysis. DG-4026 should be expanded to include other scenarios. For example, nuclear power plant generation companies in wholesale markets can contract with utilities with power purchase agreements. In such situations, the resulting service area is a single customer. In the case of a small modular reactor, the owner and operator of the plant could contract with a national lab or military base to purchase power. These situations would satisfy the need for power for those customers but may not fit within the traditional construct of a service area and the need for power analysis that would follow.
- NRC staff realized that an analysis in wholesale markets should not depend on a deficit of supply of electricity. Therefore, on Page 130 of DG-4026, the NRC staff provided the following guidance for applicants to follow in receiving a favorable “need for power” assessment even without the deficit of supply:
  - Option 1, the market-based or auction analysis, discusses how proposed plants can bid into the markets and, if needed, the market will instruct them to operate. NRC then relates this to “baseload capacity factors.” Baseload plants have an economic incentive to bid \$0 into the energy market and take whatever the market provides them because the plant will be operating no matter the situation. This option appears to be created for units operating at the margin, which historically have been natural gas plants. This could be an option for nuclear plants that may want to operate flexibly and at the margins, and not always-on baseload power. This option appears to be in opposition to the economic incentives the energy markets have created. We ask NRC to clarify this option.
  - Option 2, the agreement option, appears to fall apart under the last item “documentary evidence of the agreement between the applicant and the ISO/RTO”. Any agreements between the ISO/RTO and plant operator will not be available until the time frame in which the plant is ready to bid into capacity markets. This timeframe may vary from one-to-three years out from the capacity market taking place (e.g., in PJM, a capacity market for 2020 will take place in 2017). A nuclear plant, in the application phase, is ahead of that timeframe. Industry recommends removing this item from the guidance. **(NEI-2 [Nima Ashkeboussi])**

**Response:** *The NRC disagrees with the comment. The staff previously revised the methodology for considering need for power to allow more flexibility beyond a comparison of absolute supply versus absolute demand. With regards to Option 1 and Option 2 above, the market-based analysis was a major component of COL/ESP-ISG-026. These options are simply an economic argument that the bid price of the nuclear power reactor is (almost) always below the actual bid price that sets the market price. In the NRC staff's experience, the zero price bid strategy has been widely used by nuclear and coal generators, even though the units would operate at well below the margin under most situations. No changes were made to the RG based on this comment.*

**Comment:** Chapter 8, Section 8.1 Description of the Applicant’s Power Market AND Section 8.2 Power Demand: These sections provide guidance assuming new, greenfield applications. Further discussion, or at least acknowledgement, should be added to address repowering applications. Similar comments are raised in conjunction with Chapter 9, Environmental Impacts of Alternatives.

Revise guidance to address construction at locations other than greenfield sites. (NEI-76 [Ashkeboussi, Nima])

**Response:** *The NRC staff disagrees with this comment. The discussion of need for power does not rely on information from Chapters 4, 5 and 9 of the RG. Therefore, the type of site (e.g., greenfield versus brownfield) plays no role in the analysis of the need for power. No change was made to the RG based on this comment.*

### **Comments Concerning Alternatives**

**Comment:** Chapter 9, Section 9.2 Energy Alternatives: The DG uses the term “environmentally preferable” here and in several other places. The NRC standard is that no clearly superior site has been overlooked. An implication that a “higher” standard such as “environmentally preferable” may not be appropriate.

Check each instance of “environmentally preferable” to confirm that such usage does not create a higher criterion/threshold than ensuring no clearly superior alternative has been overlooked. (NEI-77 [Nima Ashkeboussi])

**Response:** *The use of the term “environmentally preferable” is correct for energy alternatives. The term “obviously superior” applies only to site selection. For siting, the staff first determines whether there are any environmentally preferable alternative sites. Only if an environmentally preferable alternative site is identified would the staff proceed to evaluate the situation further to determine whether the alternative site is obviously superior. If the staff determines that an alternative site is obviously superior, then it would recommend that the Commission deny the application.*

*For energy alternatives, the process is somewhat different. If the staff determines that an energy alternative is environmentally preferable, it would proceed to consider the cost of that alternative. However, the Commission has no role in determining which sources of electrical power are chosen by the applicants. So, even if an environmentally preferable energy alternative is not offset by higher costs, the staff would not recommend that the Commission deny the application. The guidance in the draft revision was meant to address this difference between energy alternatives and siting alternatives. No change was made to the RG based on this comment.*

**Comment:** Chapter 9, Section 9.3.3 Potential Sites: The guidance states:

“An applicant is not expected to conduct detailed environmental studies for potential sites; only preliminary investigations using reconnaissance-level information.<sup>21</sup> A reconnaissance-level investigation should take account of information that is readily available over the Internet or from other sources (e.g., existing studies and State and Federal agencies).

<sup>21</sup> ‘Reconnaissance-level information’ is defined as information that is available from the applicant, governmental, Tribal, commercial, and/or public sources. Reconnaissance-level information does not normally require the collection of new data or new field studies. Reconnaissance should include more than just a literature search for issues that are critical to the evaluation of sites. So, for example, reconnaissance should include contact with the water-management agency about water availability in

most cases, as discussed in the most recent version of RG 4.7. The amount and quality of information must be sufficient based on the expert judgment of the reviewer to make the required determination for which the information is needed.”

This standard is appropriate, but has not been applied consistently in recent environmental reviews, where applicants have been requested/ required to develop analyses for alternative sites beyond that considered “reconnaissance level.”

The guidance in this section is appropriate, but should be reinforced with the staff and their contractors. The issue may warrant amplification here or in NUREG-1555. **(NEI-78 [Nima Ashkeboussi])**

**Response:** *The staff agrees that the standard presented in the draft guide is appropriate. NUREG-1555 is also being updated to align with the guidance in COL/ESP-ISG-026. The commenters’ concern appears to be with how the guidance is implemented. The staff strives to implement the definition of “reconnaissance level” consistently based on the written definition that was included in the comment. The staff has noted concerns that applicants have with their attempts to define “reconnaissance level.” In each case in which there was a disagreement between staff and an applicant regarding what type of information is “reconnaissance level,” the staff has tried to make clear its basis for categorizing information as “reconnaissance level” according to the definition of the term. Clarifying edits were made to the footnote.*

**Comment:** Chapter 9, Section 9.3.5 Proposed and Alternative Sites: The DG states:

“The evaluation of the cumulative impacts at the alternative sites should be similar to that for the proposed site, except that reconnaissance-level information is used for the alternative sites. If, however, initial efforts to draw a clear differentiation between the proposed site and any alternative site proves inconclusive, then reconnaissance-level information can be expanded to include information obtained through more in-depth information gathering or visits to the affected region.”

The NRC standard is that an obviously superior site has not been overlooked. So if a recon-level analysis does not draw a clear differentiation, the regulatory basis for requiring more analysis is not clear.

Amend this portion of the guidance to indicate additional analyses beyond reconnaissance level is required only in the event of a clear indication that recon-level information could result in overlooking clearly superior site. **(NEI-79 [Nima Ashkeboussi])**

**Response:** *This portion of the guidance warrants clarification. The guidance was intended to offer the opportunity for an applicant to provide additional information regarding an alternative site that appears to be obviously superior. Providing such information would be at the discretion of the applicant.*

*The second sentence quoted in the comment (Section 9.3.5) will be revised to read, “If, however, the initial review appears to indicate that an alternative site is environmentally preferable to, or even obviously superior to, the proposed site, then additional reconnaissance-level information can be gathered to further assess whether the alternative site is obviously superior.”*

*This revised sentence more clearly states the staff’s intent for this portion of the text.*

**Comment:** Chapter 9, Section 9.3.5 Socioeconomic and Environmental Justice: The wording for Socioeconomics and Environmental Justice subsections (“If a socioeconomic topic is important enough for a discussion in the proposed site analysis, that same topic should be considered for each alternative site”) could be taken to mean that these analysis are optional for the proposed site. However, as written,



Sections 2.4 & 2.5; 4.4 & 4.5; 5.4 & 5.5 give detailed requirements for these assessments that do not sound optional.

Additionally, this guidance should be reconciled against the language in Sec. 9.3.3-9.3.5 regarding the use of reconnaissance-level information (i.e., the importance of a specific topic within socioeconomic and EJ analyses need not necessarily drive characterization of an alternative site beyond reconnaissance level, except in the case of a clear indication that an alternative site could be clearly superior.

Clarify with “If a specific topic within socioeconomic [or EJ] analyses is important enough for significant discussion within the proposed site analysis, that same topic should be considered for each alternative site. Alternative site analysis may be limited to the extent to which the topic(s) has the potential to indicate clear site superiority.” (NEI-80 [Nima Ashkeboussi])

**Response:** *The NRC staff agrees with portions of this comment. The staff did not intend to imply that analyses for the proposed site should not be included. Rather, the staff was trying to make clear that the same issues should be addressed for the proposed and alternative sites. To clarify that intent, the text will be revised to read, “For the alternative sites, an applicant should address the same socioeconomic issues that were addressed for the proposed site.” A similar change is being made for environmental justice, with some added text because there may be different pathways for environmental justice impacts at the alternative sites.*

**Comment:** Chapter 9, Section 9.4.3 Other System Alternatives: This portion of the DG is vague as to intent and when it is applicable.

Provide clarification on what constitutes “unusual circumstances” and/or what criteria should be used to determine if such circumstances exist. (NEI-81 [Nima Ashkeboussi])

**Response:** *The staff will retain the phrase “unusual circumstances” to emphasize that it does not expect that this section of the RG will be used very often, and the staff has modified the text of Section 9.4.3 to clarify the use of the phrase as follows:*

*In unusual circumstances, an applicant may find that consideration of alternative designs for other systems (e.g., the cooling system specific to the service water system) may be warranted. This situation could arise if a system other than the cooling water system for the main condensers (already addressed above) (1) would have unavoidable environmental impacts from construction (as defined in 10 CFR 51.4) or operations that are greater than SMALL; and (2) the use of an alternative system design would possibly reduce those impacts to a lower significance level. In such cases, the applicant should develop and compare appropriate alternatives to determine if any is environmentally preferable to the proposed system. This portion of the guidance should not be used if the significant environmental impacts are caused by the project as a whole, as opposed to a discrete system.*

### **Comments Concerning Benefit-Cost**

**Comment:** Cost-Benefit Analysis

NUREG-1555 guides the staff to review internal costs as discussed in Section 10.6.2 of this Draft Regulatory Guide. The financial information expected is overly burdensome and may not be completely calculable by the applicant at the time the Environmental Report is prepared. In fact, years may pass before the applicant will obtain financing. Industry asks staff to provide the regulatory basis for this requirement. Alternately, as part of its safety review under 10 CFR 52.27, 10 CFR 50.33, and Part 50

Appendix C, the NRC reviews the financial qualifications of applicants for Combined Licenses. In April 2015, the NRC staff issued a draft regulatory basis document (ML15111A270) to propose changes to financial qualification requirements from “financially qualified” to “appears to be financially qualified”. South Texas Project Units 3 and 4 requested (ML15140A077) and received an exemption (ML16040A174) allowing them to receive their licenses under the proposed new standard. Industry recommends that for the purposes of NRC’s NEPA review under 10 CFR Part 51, the information in Section 10.6.2 should be explicitly derived from the safety review under 10 CFR Parts 50 and 52 and no additional burden should be placed upon the applicant beyond what is already reviewed in the Safety Evaluation Report. **(NEI-3 [Nima Ashkeboussi])**

**Response:** *The NRC understands with the comment. The staff is not requesting exact numbers, nor is the staff asking for financial qualification information. Rather, it is requesting that the applicant provide a reasonable estimation of what the construction and operation costs might be. This information is readily available through numerous sources, such as Energy Information Agency (EIA), Massachusetts Institute of Technology (MIT), and National Research Council studies. This information is necessary to perform the benefit-cost balancing required by 10 CFR 51.45(c). The issue of the financial qualifications of an applicant is beyond the scope of the staff’s NEPA review and has no bearing on the benefit-cost balancing. No change was made to the RG based on this comment.*

#### **Comments Concerning Emergency Planning**

**Comment:** Emergency Planning/Evacuation Zones: NRC has two emergency planning zones (EPZs) around each nuclear power plant to help plan a strategy for protective actions during an emergency. One is a 10-mile radius EPZ which addresses the plume exposure pathway. The other is a 50-mile EPZ which addresses the ingestion exposure pathway. The RG briefly discusses the requirement to address the 50-mile EPZ. EPA recommends that it also discuss the requirement for the 10- mile EPZ. **(EPA-7 [Tomiak, Robert])**

**Response:** *The NRC disagrees with this comment. The RG does not address either the 10 or 50 mile EPZ. Emergency planning is a safety review issue and is not addressed in this RG. No change was made in the RG based on this comment.*

#### **Comments Concerning Climate Change**

**Comment:** Climate, page 48: EPA recommends that the discussions on effects from severe weather phenomena include flooding and sea level rise. **(EPA-5 [Tomiak, Robert])**

**Response:** *The NRC understands this comment. Flooding and sea level rise are already included in the discussion of climate change. The last bullet in Section 2.7.1, addresses these impacts of climate change. That bullet requests that the applicant discuss potential climate change in the vicinity of the site over the period encompassing the licensing action, as well as the potential impacts of climate change on relevant meteorological parameters (e.g., temperature, precipitation, and the frequency and severity of storms). No change was made to the RG based on this comment.*

#### **Comments Concerning Appendix A - Part 50 and Part 52 Licenses and Authorizations**

**Comment:** Appendix A, Sec. A.1, Early Site Permits: The DG appendix states: “An applicant for an ESP should review previous applications along with associated requests for additional information (RAIs) to gain an understanding of the level of detail needed to receive an ESP.”

While this is reasonable advice, the trend has been toward ever-increasing application content, “informed” by prior applications in a feed-forward fashion that has the net effect of increasing regulatory burden. For regulatory burden to grow as plant designs increase margins of safety is counterintuitive and contrary to efficient regulation.

While this language is seemingly innocuous, it should be balanced with an acknowledgment of the need for regulatory stability and objective criteria to be met from one application to the next. **(NEI-82 [Nima Ashkeboussi])**

**Response:** *The NRC agrees with this comment. The NRC modified the following paragraph in Section A.1: “An applicant for an ESP should review previous applications along with associated requests for additional information (RAIs) to gain an understanding of the level of detail needed to receive an ESP. However, an applicant should only include in its ER information that is needed to analyze the environmental impacts for its project.” The applicant should also review NUREG-1555 and this RG for guidance regarding the level of detail expected in the application. In addition, the applicant can discuss with the NRC any questions regarding the level of detail during pre-application interactions.*

**Comment:** Appendix A, Sec. A.2, Combined License Referencing an Early Site Permit: The DG appendix states: “All the information described in Part C, with the exception of alternative sites, should be reviewed by the applicant to determine if any new and significant information has become available since the issuance of the ESP EIS. If new and significant information has become available, the applicant must include it in the ER for the COL referencing the ESP.”

Additional guidance is needed in determining the “shelf life” for environmental data. While the DG says in other locations (e.g., Sec. 2.3.1) that “studies work ideally show the condition of the ecological resources that exist no more than 5 to 10 years prior to NRC receiving the application,” it has more often been the case that the staff have suggested that data older than two to five years must be “refreshed” for a COLA.

With a typical review time of 3+ years for an ESP, if data must be refreshed after two years, then an ESP is of highly questionable value vis-à-vis finality for site findings, contrary to the statement in Sec. A.1 that “[t]he ESP process is meant to resolve [site-specific environmental safety and emergency planning] issues well in advance of when a decision is made to build a nuclear power plant.”

The staff should establish consistent guidance on the “age” threshold for “new and significant” information that recognizes the value of an ESP and the need for regulatory stability. **(NEI-83 [Nima Ashkeboussi])**

**Response:** *The NRC disagrees with this comment. The regulations (10 CFR 51.92(e)(7)) for a COL referencing an ESP state: “Include an analysis of the issues related to the impacts of construction and operation of the facility that were resolved in the early site permit proceeding for which new and significant information has been identified, including, but not limited to, new and significant information demonstrating that the design of the facility falls outside the site characteristics and design parameters specified in the early site permit.”*

*However, an applicant can rely on information in an ESP if there is no new and significant information. No change was made to the RG based on this comment.*

## **Comments Concerning Appendix B – Consultations**

**Comment:** With the exception of the final paragraph, this appendix provides direction almost exclusively to the staff. Consider moving this information to NUREG--1555, or include appropriate guidance to applicants. (NEI-84 [Nima Ashkeboussi])

**Response:** *The NRC staff understands the comment. While the commenter is correct that formal consultations are completed by the NRC rather than the applicant, the staff believes that it is instructive for the applicant to understand what information the NRC will need to complete consultations, such as those under the ESA and NHPA. Providing the requisite technical information in the ER will assist in the efficacy of the staff's consultation process. Additional text has been added to Appendix B explaining what the applicant can do to support NRC's consultation efforts.*

## **Comments Concerning Appendix C – Small Modular Reactor Design**

**Comment:** Very little of the guidance in this appendix is unique to SMRs. In particular Sec. C.7 offers guidance that is generic in almost every case to multi-unit LLWRs as well.

Secs. C.1 through C.6 offer useful insights that, if this appendix is absorbed into the main DG text, would make sense to highlight. Similarly, Sec. C.7.9 is helpful for smaller reactors (SMRs or otherwise). But the balance of the appendix includes guidance that is generally applicable to any design. (NEI-85 [Nima Ashkeboussi])

**Response:** *The NRC disagrees with this comment. Appendix C provides adequate guidance for SMRs and non-LWRs given the current state of anticipated applications. No change was made to the RG based on this comment.*

**Comment:** Appendix should be reviewed for consistent/appropriate usage of terms “unit” and “module”. (NEI-86 [Nima Ashkeboussi])

**Response:** *The staff added the following sentence to Appendix C: “The terms unit and module both refer to a reactor and are used interchangeably in this appendix.”*

**Comment:** The DG appendix states “An SMR is a reactor unit with a nominal output of 300 MW(e) or less that is able to be factory fabricated and transported to the site for assembly of components and operation.” This is not a formal definition, and an SMR is not typically thought of as only a single unit. Further, SMRs are not necessarily “factory fabricated,” although many modules are.

To avoid confusion and maintain consistency with other usage by NRC, change to:

“An SMR is generally considered to be a nuclear plant consisting of one or more reactor units, with a nominal output of 300 MWe or less per unit. SMRs may also include use of construction modules fabricated offsite and transported for assembly at the plant site.” (NEI-87 [Nima Ashkeboussi])

**Response:** *The staff understands the comment. The staff modified the explanation of the term SMR in Appendix C along the lines suggested by the commenter for clarity.*

**Comment:** Appendix C, C.1 Licensing Scenarios: The subsections of this section should be renumbered from C.2 through C.6 to C.1.1 through C.1.6 (or similar) to reflect the fact that they are subsections of the C.1 topic. (NEI-88 [Nima Ashkeboussi])

**Response:** *The NRC agrees with this comment. The staff renumbered the subsections in Appendix C, Section C.1 in response to this comment.*

**Comment:** Appendix C, Section C.3, para. 1: Section C.3 states, “An applicant could request licenses for one or more modules and inform the NRC that it intends to request licenses for additional modules in the future. Under this scenario, the proposed action would include only the modules for which licenses are requested. The applicant should provide sufficient information to allow the NRC to determine whether the additional modules are reasonably foreseeable for the purposes of evaluating cumulative impacts. For the additional modules to be treated as reasonably foreseeable, the siting study submitted with the original application should include consideration of all the modules.”

It is unclear how the NRC would determine whether the additional modules are reasonably foreseeable. Would it be tied to a certain period of time in which the modules would be installed? For example, it could be stated that reasonably foreseeable is if a requested additional module is to come on line 15 years or less after initial module and any time greater than 15 years is not reasonably foreseeable.

It seems a determination on foreseeability would be unnecessary if it is understood that, by definition, if the applicant put the future module in the siting study (or elsewhere in the application) they foresaw it (and therefore was reasonably foreseeable) and if they didn't then it was unforeseen (and therefore not reasonably foreseeable).

Elaborate on and clarify how future modules are determined to be reasonably foreseeable or not. **(NEI-89 [Nima Ashkeboussi])**

**Response:** *The NRC agrees with the comment. The use of the phrase “sufficient information to allow the NRC to determine whether the additional modules are reasonably foreseeable” is unclear. The NRC will consider the additional modules reasonably foreseeable if the applicant states such in the ER and the siting study. However, the applicant must provide information on the possible future modules for the NRC to consider in the evaluation of cumulative impacts. The text in the RG Appendix C, Section C.1.2 was modified based on this comment.*

**Comment:** Appendix C, C.4 Two or More Separate License Applications: The DG appendix states: “An applicant may request a license for a certain number of modules without the siting analysis and ER considering additional modules at that site as reasonably foreseeable. The ER (and the NRC’s EIS) will only consider the modules requested. If an applicant submits a subsequent application for additional modules, the ER will have to address all of the issues in this RG including alternative sites and alternative energy.”

This section identifies a scenario where a license for additional modules may be sought at a later date, but not identified in the original application. The description of regulatory risk for this scenario would benefit from clarification.

Restate along the lines of:

“In certain circumstances, a licensee or applicant may identify the need for additional modules subsequent to the initial application, which could create the option of a subsequent application for additional modules not considered as reasonably foreseeable in the original siting analysis and ER. The initial ER (and the NRC’s EIS) will only consider the modules requested. If an applicant submits a subsequent application for additional modules, the ER will have to address all of the issues in this RG including alternative sites and alternative energy.” **(NEI-90 [Nima Ashkeboussi])**

**Response:** *The NRC agrees with this comment. The staff has revised the text in Section C.1.3 along the lines proposed by the commenter to more clearly explain the implications of this scenario.*

**Comment:** Appendix C, Section C.7.9: The 4th paragraph states that “an applicant may propose to use excess heat for industrial processes or station heating as an additional purpose for the proposed project, or provide a secure energy source for military, government, or critical industrial facilities. In these cases, the applicant must still submit alternative sites.”

Staff must justify this need and the regulatory basis. Additionally, clarify the impact of having to submit alternative sites for “military, government, or critical industrial facilities” when such facilities present brownfield applications. (NEI-91 [Nima Ashkeboussi])

**Response:** *Regardless of the purpose of the proposed project, 10 CFR 51.45(b) requires the applicant to address alternatives to the proposed action, including alternative sites. If a proposed site already hosts industrial facilities, that fact may affect the specific analyses but does not relieve the applicant from the requirement to consider alternatives. However, if a proposed reactor will provide power to a specific load, and logically must be located in close proximity to that load, then the region of interest for siting will be much smaller than the region of interest typically considered for LLWRs designed to supply power to a grid. See, for example, the siting process in the current review of the Clinch River application. The staff added additional clarifying text in Section C.2.9 of the RG in response to this comment.*

#### **General Comments in Opposition to Nuclear Power**

**Comment:** Please shut down all nuclear power plants as between 2017 and 2038 there will be increased earthquake activity, and it is INSANE to have ANY nuclear power plants!!! Stop the radiation poisoning of Americans and citizens of the world. (MD-1 [Darling, Marj])

**Response:** *This comment provides no specific information relevant to preparation of an ER for nuclear power plants. No change was made to the RG based on this comment.*