Attachment 6: Staff Guidance for Alternatives Reviews for New Reactor Environmental Impact Statements
COL/ESP-ISG-026

Background

The Environmental Standard Review Plan (ESRP) or NUREG-1555 (NRC 2000) directs the staff's assessment of potential impacts of alternatives to the proposed action. There are various subparts to the alternatives analysis including the no-action alternative, alternative energy sources, site selection, and alternative systems designs. The guidance below is divided between clarifications and changes. Clarifications address cases in which the ESRP already addresses the issue adequately, but the staff has determined it would be useful to provide some clarification. Changes address cases in which the ESRP does not address the issue. For changes, the guidance below also includes a "Reason for Changes" to explain why new guidance is being added to the ESRP.

Rationale

The purpose of this guidance is to clarify certain aspects of the alternatives analysis for new reactors. This guidance clarifies the ESRP Sections 9.1, No-Action Alternative; 9.2.1, Alternatives Not Requiring New Generating Capacity; 9.2.2, Alternatives Requiring New Generating Capacity; 9.2.3, Assessment of Competitive Alternative Energy Sources and Systems; 9.3, Site Selection Process; and 9.4.3, Transmission Systems. All of these ESRP sections were revised in July 2007, except for Section 9.1 which was last published in March 2000.

Staff Guidance

ESRP Section 9.1, No-Action Alternative

The current guidance in ESRP Section 9.1 is adequate for the reviews, but warrants some clarification because reviewers continue to have difficulty describing this alternative. In large measure, this is because the no-action alternative isn't really feasible if a need for power in the region of interest (ROI) has been demonstrated in Chapter 8[1]. With a demonstrated need for power, doing nothing would mean significant consequences to people living in the ROI as the power system became unreliable because of inadequate generating capacity. The Council on Environmental Quality (CEQ) guidance states, "Where a choice of "no action" by the agency would result in predictable actions by others, this consequence of the "no action" alternative should be included in the analysis" (CEQ 2012). Reviewers know that regulatory authorities (typically a State public service commission, or equivalent, in conjunction with any regional transmission operator and electrical reliability council) would take action to meet the need for power before the grid became unreliable. Because of this, the staff will generally discuss what other steps might be taken to address the need for power. The no-action alternative in the Final

[1] This discussion relates only to those cases in which a need for power has been established. An early site permit (ESP) is not required to address the need for power. See Section 8.1 of the final EIS for the Clinton ESP for an example of the discussion of the no-action alternative in such a case.

Environmental Impact Statements (FEIS) for the Calvert Cliffs, V.C. Summer, and the South Texas Project combined license (COL) applications may serve as examples for reviewers of the no-action alternative.

ESRP Section 9.2, Energy Alternatives

Issue Discussion: A number of issues have been raised regarding energy alternatives during the development of recent Environmental Impact Statements (EIS). Many of these issues are focused on providing to the readers more information to explain the basis for the staff's analyses and conclusions. In addition, the Commission directed the staff (CLI-09-21, dated November 3, 2009) (NRC 2009) to include consideration of carbon dioxide and other greenhouse gas (GHG) emissions in its environmental reviews for major licensing actions under the National Environmental Policy Act (NEPA) of 1969, as amended. These issues are discussed in the section-specific guidance below.

As a general matter, in considering energy alternatives, the reviewer should apply a principle similar to that used for cumulative impacts regarding whether an activity is "reasonably foreseeable." Specifically, for an energy alternative that has not been proven to be capable of meeting the need for power developed by the reviewer for Chapter 8, the reviewer should evaluate the extent to which development of the alternative is likely, or reasonably foreseeable, in the ROI. In this regard, this guidance is differentiating between the theoretical potential of an alternative (e.g., offshore wind) and the likely development of that resource in the ROI. This is appropriate because analyses performed under NEPA should not be speculative. Rather they should be based on a reasonable analysis using the best available information.

In addition, the reviewer for ESRP Section 9.2 should coordinate with the reviewer for ESRP 8.0 to ensure that there is consistency in the projections of future energy production in the ROI.

Section-specific guidance follows.

ESRP Section 9.2.1, Alternatives Not Requiring New Generating Capacity

The current guidance in ESRP Section 9.2.1 is adequate for the reviews, but warrants some clarification. The reviewer's analysis of conservation and increased energy efficiency[2] as an alternative to construction of the proposed plant should be based on the analysis and evaluation of conservation and substitution received from the reviewer for ESRP Section 8.2.2, and information available from other authoritative sources such as U.S. Department of Energy (DOE) and State regulators. Whereas in Chapter 8 the staff identifies the planned efforts regarding conservation in the relevant service area, the reviewer for ESRP Section 9.2.1 should evaluate whether additional conservation above those plans is reasonably achievable. Information sources for this portion of the review might include an applicant's "high case" for

[2] Conservation and energy efficiency reduce the amount of energy being used either by changing how energy is used (e.g., raising the temperature maintained by a building cooling system 1°F) or using less energy to achieve the same function (e.g., replacing fluorescent bulbs with CFL bulbs). This is differentiated from demand-side management activities (e.g., time-of-day pricing) that are aimed at reducing the peak demand on the system.

conservation, or analysis by authoritative sources regarding how much power might be saved through conservation. The reviewer should consult with and assist the reviewer for ESRP Section 8.2.2 in analyzing the effects of conservation on power demand. The reviewer should consider whether the conservation measures being considered address issues of peak demand versus baseload demand, and compare this to the purpose and need for the project. The reviewer does not need to analyze the potential for conservation if the applicant is proposing to build a merchant plant and did not address the potential for conservation in the Environmental Report (CLI-05-29, Exelon Generation Co., LLC (NRC 2005), see also the South Texas Project COL FEIS (NRC 2011).

ESRP Section 9.2.2, Alternatives Requiring New Generating Capacity

The following information should be considered by the reviewer, in addition to the existing ESRP guidance:

- The capacity factor of the proposed project and each competitive alternative should be considered by the reviewer when determining the equivalence of an alternative. (See, for example, Section 9.2.2 of the draft EIS for the Fermi COL application.) If the proposed project is intended to supply baseload power, then any competitive alternative must also be capable of supplying baseload power.[3]

- If a potentially competitive alternative has a capacity factor significantly lower than that of the proposed project (e.g., wind, solar), consider whether the alternative could be competitive if a form of energy storage or back-up power is included. However, the feasibility and environmental impacts of energy storage or back-up power would have to be included in the evaluation of the alternative. (See, for example, Section 9.2.2 of the draft EIS for the Fermi COL application.)

- If a noncompetitive alternative is available in the relevant service area, also include an evaluation of the projected growth of that alternative for consideration in a combination of alternatives. The reviewer should consult authoritative sources such as a State renewable portfolio standard, State projections, and projections by the DOE for information on the projected growth of energy sources. The reviewer should also consider the existing energy mix in the ROI. (See, for example, Sections 9.2.3.2 and 9.2.3.3 of the draft EIS for the Lee COL application.)

- Alternative generating technologies found to be not competitive as the only source of electricity may be competitive when included in a combination of technologies. The reviewer should develop one or more combinations of alternatives that include some generating sources that were not individually competitive, but which are available in the relevant service area. Using the information on the projected growth of each available source, develop a value (or range of values) for the contribution of that alternative to the

[3] A baseload power plant is designed to operate continuously to supply all or part of the system's minimum load (DOE/EIA 2011). Baseload power plants typically have annual load capacity factors that exceed 75 percent, but usually operate 90 to 98 percent of the time (Hynes 2009).

combination. (See, for example, Section 9.2.4 of the draft EIS for the Lee COL application.) Include in the discussion information regarding the uncertainty in the projections of growth and how different values for growth for individual sources would affect the environmental impacts of the combination of alternatives. (See, for example, Section 9.2.4 of the final EIS for the Calvert Cliffs COL application.)

The reviewer should give priority to the inclusion of those sources with the least environmental impacts. Clearly differentiate between the installed (i.e., nameplate) capacity of an alternative, and its average output as a part of a combination of alternatives. The reviewer should then evaluate the environmental impacts of the combination(s) of alternatives for use in ESRP Section 9.2.3.

Rationale for Changes: Recent experience has shown that the type of detail discussed above is necessary to properly compare alternatives and to develop one or more combinations of alternatives that have a logical basis for the region of interest.

ESRP Section 9.2.3, Assessment of Competitive Alternative Energy Sources and Systems

The following information should be considered by the reviewer, to clarify the existing ESRP guidance:

Cost data is only used in this portion of the review to further evaluate competitive alternatives that are determined to be environmentally preferable to the proposed action. If no environmentally preferable alternative is identified, then cost data is not needed or used.[4] If cost data is used, see Appendix 1 at the end of this portion of the guidance for clarified guidance regarding the methods to be used.

In addition to the existing ESRP guidance, the reviewer should compare the emissions of carbon dioxide from the proposed action to those from all competitive energy alternatives.

Rationale for Change: In the Commission Memorandum and Order regarding *Duke Energy Carolinas, LLC* (COL Application for Williams States Lee III Nuclear Station, Units 1 and 2) and *Tennessee Valley Authority* (Bellefonte Nuclear Power Plant, Units 3 and 4) CLI-09-21, dated November 3, 2009 (NRC 2009), the Commission directed the staff to "include consideration of carbon dioxide and other greenhouse gas emissions in its environmental reviews for major licensing actions under the National Environmental Policy Act." In response to this direction, the staff issued a memorandum containing detailed guidance for consideration of the effects of GHG and of climate change, including the evaluation of alternative energy sources in Chapter 9 of the EIS (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100990204) (NRC 2010a). The memorandum includes detailed background information regarding GHG and examples of how the effects of GHG can be addressed in an EIS. The guidance in that memorandum has been updated in Attachment 1 to this Interim Staff Guidance.

[4] While the staff does not consider cost when it determines if an alternative is environmentally preferable, some data sources that are frequently used by the staff (e.g., the U.S. Department of Energy, Energy Information Administration, or DOE/EIA) do consider the cost of generated electricity when making projections of the growth of different types of generating sources.

ESRP Section 9.3, Site Selection Process

Issue Discussion: In order for the staff to perform its evaluation, and conduct a reasonable comparison of sites, the staff has determined that it will perform a cumulative impacts analysis for each of the resource areas at each alternative site in the comparison process.[5] This will put the analysis of the alternative sites in Chapter 9 on an equal footing with the analysis of the cumulative impacts at the proposed site in Chapter 7. A key difference is that the analysis of the alternative sites will be performed at a reconnaissance level, as is already discussed in ESRP Section 9.3. ESRP Section 9.3 is not specific as to whether cumulative impacts would be used for the comparison. So this additional guidance specifies that cumulative impacts will be used for comparison of alternative sites. To implement the use of cumulative impacts for the alternative sites, an approach similar to that used in Chapter 7 will be used. The staff issued a memorandum containing detailed guidance (Accession No. ML100621042) (NRC 2010b) for analyzing cumulative impacts at alternative sites. The guidance in that memorandum is being updated in this portion of the interim guidance document. This updated guidance supplements the ESRP direction to the staff for review of the cumulative impacts associated with the proposed project at the alternative sites when considered in the context of other past, present and reasonably foreseeable future actions. The scope of the cumulative impact analysis will include identification of the time frame of the analysis, the geographic area of interest, the baseline for the analysis and other actions that could contribute to the cumulative impact.

As discussed for ESRP Section 9.2.3, the Commission directed the staff to "include consideration of carbon dioxide and other greenhouse gas emissions in its environmental reviews for major licensing actions under the National Environmental Policy Act." The staff developed detailed guidance for consideration of the effects of GHG and of climate change, including the evaluation of alternatives in Chapter 9 of the EIS (Accession No. ML100990204) (NRC 2010a). The guidance in that memorandum has been updated in Attachment 1 of this interim guidance document.

The following information clarifies the existing ESRP guidance:

- "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 regarding water availability in most cases, as discussed in Regulatory Guide (RG) 4.7 (NRC 1998). 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.

- The reviewer must be able to conclude, based on expert judgment, that each alternative site could be used to build and operate the proposed project. For example, as stated in

[5] Cumulative impacts are only considered at the last stage of the site selection process, when the alternative sites are compared to the proposed site.

RG 4.7, there should be reasonable assurance that the applicant could obtain the necessary water use permits for the proposed project at each alternative site.

- For the "obviously superior" test, facility costs should include any additional costs associated with building and operating the proposed unit(s) at the environmentally preferable site. These costs could include items such as the cost of (1) modifying the plant design, (2) additional grading and fill, (3) ecological and cultural resource surveys, (4) the ongoing cost of establishing and operating a new emergency plan (if the proposed site already has such a plan in place), (5) the cost of obtaining the alternative site, and (6) the cost of any delay associated with changing sites. Institutional constraints could include items such as (1) known objections of regulatory agencies, (2) grid stability issues at the alternative site, (3) lack of franchise privileges and eminent domain powers, (4) the need to restructure existing financial and business arrangements, and (5) the feasibility of obtaining the alternative site. For background, see *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458; *Public Service Company of New Hampshire, et al.* (Seabrook Station Units 1 and 2), ALAB-471; and *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87, 95-96 (1st Cir 1978).

The following information should be considered by the reviewer, in addition to the existing ESRP guidance:

- If the proposed action requires an individual permit from the U.S. Army Corps of Engineers (USACE), then USACE will perform its own analysis to determine whether the proposed site is the least environmentally damaging practicable alternative (LEDPA) (40 CFR Part 230). While the USACE evaluation of the LEDPA site and the NRC staff evaluation whether there is an obviously superior alternative site consider similar factors, there are some differences in the focuses of the two evaluations. The LEDPA determination is normally documented in the Record of Decision for the USACE permit, and not in the EIS. The NRC staff reviewer should coordinate with the contact at USACE to ensure both agencies have access to the same supporting data and to minimize the potential for conflicts in such data between the two evaluations. The NRC staff expects that the applicant will likewise work closely with the USACE to minimize the potential for inconsistencies. However, the NRC staff reviewer should review the applicant's submittal(s) to USACE to ensure that the data and supporting information in that document is not inconsistent with the information the applicant has provided to the NRC staff. But the reviewer should also be aware that the conclusions of the two processes are independent and that it is possible for a site to be a reasonable alternative for the purposes of NEPA, and to also be impracticable for the purposes of LEDPA.

- In the consideration of impacts at the candidate sites, cumulative impacts should be considered. For example, the consumptive use of water should not be compared just to the flow in the river. Rather, the consumptive use of water should be compared to the flow in the river in light of other withdrawals from the river and any restrictions on withdrawals by regulatory agencies. See Appendix 2 at the end of this portion of the guidance. The reviewer should include the potential impacts of climate change on the plant at each alternative site.

- The reviewer should include a discussion of the impacts of emissions of GHG (including carbon dioxide) from the proposed unit(s) at each alternative site.

- If one or more of the alternative sites appears to be environmentally preferable to the proposed site, the reviewer should inform the Environmental Project Manager (EPM). The EPM and the reviewer should determine whether there is additional information available from the applicant, other agencies, or other sources, regarding those issues for which the alternative site(s) appear to be better than the proposed site. However, this information would still be reconnaissance level information. If, after reviewing any additional information, one or more alternative sites still appear to be environmentally preferable to the proposed site, then the reviewer must determine whether any such site is obviously superior to the proposed site. This portion of the evaluation brings into consideration factors other than the environmental impacts at the proposed and alternative sites.

- ~~In addition, there is a special demographic consideration for the proposed versus the alternative sites. In terms of a review of demographic aspects of the site-selection process, the population density guidelines of RG 4.7 have been interpreted by the staff in the following manner:~~

  - ~~If, on balance, there is an alternative site of approximately equal merit regarding issues other than population density, and~~

  - ~~If the proposed site has a population density substantially greater than that alternative site, and~~

  - ~~If the density at the proposed site is in excess of the stated RG 4.7 values (NRC 1998), then the alternative site is obviously superior to the proposed site.~~

Rationale for Changes: The following are the reasons for each of the changes above:

- The USACE is now typically a cooperating agency on NRC EISs for ESPs and COLs. Guidance has been added regarding how this affects the review of alternative sites.

- As discussed in the summary, the NRC staff has determined that it should use cumulative impacts when comparing sites in order to present a complete picture of the impacts.

- As discussed in the summary, and in the interim guidance for ESRP Section 9.2.3, the Commission has directed the staff to consider GHG emissions and climate change in its environmental reviews.

- The current ESRP provides limited guidance on the actions the staff should take if it appears that there is an environmentally preferable site. Because the decision regarding site selection is so important to the overall Agency decision, guidance has been added

to look for additional reconnaissance level information to confirm whether an initial determination that an alternative site is environmentally preferable is correct.

- ~~The March 2000 ESRP Section 9.3 included an Appendix B that provided guidance specific to demography. This appendix was inadvertently deleted in the July 2007 draft revision and is being reinstated through this interim guidance.~~

ESRP Section 9.4.3, Transmission Systems

ESRP Section 9.4.3 will no longer be used for NRC staff environmental reviews.

Rationale for Change: ESRP Section 9.4.3 directs the staff to evaluate alternatives to the proposed transmission systems. However, with the October 2007 change in the definition of "construction" in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.10 and 10 CFR 51.4, transmission lines are clearly not construction. Because the transmission lines are not within the definition of construction, the staff will no longer consider alternative transmission systems. ESRP Section 9.4.3 will be deleted in a future revision to NUREG-1555.

Appendix 1: Regarding Cost Considerations for an Energy Alternative that is Environmentally Preferable to the Proposed Action

The economic cost data to be analyzed for competitive alternatives deemed to be environmentally preferable to the proposed action are the estimated costs of constructing the facility and supplying electrical energy services over the expected life of the proposed project. The data should span 40 years. If the useful life of the competitive alternative(s) under review differs from that of the proposed project, the staff should ensure the comparison is performed over the same time period. For instance, if the useful life of a natural gas-fired power plant were to be only 15 years, the staff's analysis should consider a full replacement of the natural gas units after 15 years, and a second full replacement after 30 years. In the case of options involving generation, staff should analyze the 40-year levelized cost of electricity (LCOE), the equivalent annual cost of capital (EAC), the annual cost of operations, maintenance, and fuel for each alternative; at the same level of output and for appropriate plant capacity factors. The analysis should be displayed in a tabular form such as shown in Table 9.2.3-2. The staff should review any independently derived LCOE calculations to ensure they are reasonable. Other tables provided in this ESRP include worksheets that can assist in this evaluation.

The following table and text is a complete replacement for the current ESRP's Table 9.2.3-2 through Table 9.2.3-14.

Table 9.2.3-2: The Levelized Cost of Electricity--Evaluation of Competitive Alternatives

		Proposed Project	Competitive Alternative
A	Overnight Capital Cost		
B	Equivalent Annual Cost of Capital		
C	Annual Operating and Maintenance Costs		
D	Annual Transmission Investment		
E	Annual Fuel Costs		
F	Decommissioning Costs		
	Levelized Cost of Electricity (B+C+D+E+F)		

Instructions:

Overnight Capital Cost for the proposed project, the overnight capital cost is the total cost of the proposed project, without consideration of the cost of capital. For the competitive alternative, that is also true for the hypothetical units installed at the beginning of the 40 year scope of the analysis. However, the useful life of the competitive alternative will probably not be 40 years, which requires the following adjustments to be made to the value of overnight capital.

- For a useful life greater than 40 years, X, the overnight capital cost is the straight line depreciated value of the alternative over its useful life, summed for only the first 40 years:

$$OCC = \left({}^{AOCC}/_{X}\right) \times 40$$

Where OCC = Overnight Capital Cost
AOCC = Actual Overnight Capital Cost
X = The useful life of the competitive alternative

- For a useful life of less than 40 years, Y, the overnight capital cost is the full cost of the first N units, plus the full cost of any "intermediate" unit(s) (assuming the useful life is short enough to require more than one replacement), and the adjusted overnight capital cost of the last unit(s) according to the equation below.

$$OCC = (N \times AOCC) + \left({}^{AOCC}/_{Y}\right) \times (40 - NY)$$

Where OCC = Overnight Capital Cost

For instance, for a competitive alternative that costs $1 million and has a useful life of 15 years, it would take two full installations and the first 10 years of a third installation to achieve 40 years of operation (the same as the proposed project). So the overnight capital cost of the competitive alternative would be:

$$OCC = (\$1M \times 2) + \left(\frac{\$1{,}000{,}000}{15}\right) \times \left(40 - (2 \times 15)\right)$$

$$OCC = \$2M + \left({}^{\$10{,}000{,}000}/_{15}\right) = \$2{,}666{,}667$$

Equivalent Annual Cost (EAC) of capital is the amount one would need to pay annually for 40 years to fully pay for the overnight cost of capital. It is obtained with the following calculation:

$$EAC = \frac{OCC}{CRF}$$

Where EAC = Equivalent Annual Cost of Capital
CRF = the 40-year Capital Recovery Factor

$$CRF = \frac{(1 - 1.07^{-40})}{.07} = 13.3317$$

For our example, the annual amount the applicant would have to spend to fully pay for the $2,666,667 overnight capital cost of the alternative would be

$$\frac{\$2{,}666{,}667}{13.3317} = \$200{,}004.50$$

Operations, maintenance, transmission, decommissioning, and fuel costs can be obtained independently through a number of reasonable sources, such as the DOE's Energy Information Administration.

Appendix 2: Regarding the Consideration of Cumulative Impacts for the Alternative Sites

The evaluation of cumulative impacts at the alternatives sites is performed in much the same way as the evaluation of cumulative impacts at the proposed site in the earlier chapters of the EIS. There are two primary differences. First, for the alternative sites the information being used is reconnaissance level information and is typically not as detailed as the information available for the proposed site. Second, all of the information for the alternative sites is in Chapter 9, while for the proposed site the cumulative impacts evaluation in Chapter 7 draws from Chapters 2 through 6.

For each resource, the reviewer will evaluate the impacts of building and operating the proposed project at each alternative site. Because the results of this portion of the evaluation is not the cumulative impact, the staff will describe impacts, but will not reach a conclusion using the typical significance levels (i.e., the reviewer will not use the terms SMALL, MODERATE, or LARGE). In describing the effects of just the proposed project, the reviewer should use terms that make clear the relative impacts expected. So, depending on the expected effects, a reviewer might describe them as "minor," or "noticeable but not destabilizing," or "significant and potentially destabilizing." The reviewer must ensure that the discussion is sufficient to support the impact determination.

After completing this discussion of the impacts of the proposed project, the information in the table of projects around the site will be used by the reviewer, as appropriate for the resource under consideration, to evaluate the cumulative impacts of the proposed project at the alternative site when considered in combination with other projects and activities affecting the same resource. The reviewer should make clear what projects or activities from the table contributed to the cumulative impacts for a specific resource. (For example, under socioeconomics, the effects of past projects are generally reflected in the current data being used to describe the existing conditions). The cumulative impacts evaluation will end with the designation of the impact level (SMALL, MODERATE, or LARGE) to the resource. In addition, if the impacts are greater than SMALL, the reviewer will state whether or not the proposed project (building and operating one or more nuclear plants) is a significant contributor to the impacts. In the context of this evaluation, "significant" is defined as a contribution that is important in reaching the impact level determination. This information will be used in the comparison of the sites.

After evaluating the cumulative impacts of the proposed project at each of the alternative sites, the reviewer will compare these sites to the proposed site. For the proposed site, the reviewer will use the cumulative impacts information from Chapter 7, as well as the information regarding the impacts of the project from Chapters 4 and 5. For a given resource, the comparison of the cumulative impact characterization (SMALL, MODERATE, or LARGE) will often be sufficient. However, the reviewer will have to consider cases in which the proposed project is not a significant contributor to the impacts at either the proposed or an alternative site. So, for example, assume that both the proposed site and alternative site "A" are described as having a MODERATE impact on terrestrial resources. However, the staff has concluded that building and operating the nuclear unit(s) is a significant contributor to the impacts at the proposed site,

but is not a significant contributor at the alternative site “A.” In such a case, the reviewer will describe the situation so that readers will understand the contribution of the proposed project at each site. This information will also be used by the reviewer in determining whether an alternative site is environmentally preferable to the proposed site.

References

1. 10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, "Domestic Licensing of Production and Utilization Facilities."

2. 10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

3. 40 CFR Part 230. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 230, "Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material."

4. *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458

5. Council on Environmental Quality (CEQ). 2012. *NEPA's Forty Most Asked Questions*, accessed at http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm, November 7, 2012.

6. Department of Energy, Energy Information Administration (DOE/EIA). 2011. *Electricity Terms and Definitions*, accessed at http://www.eia.gov/cneaf/electricity/page/glossary.html. Accession No. ML12026A660.

7. John Hynes (Hynes). 2009. *How to Compare Power Generation Choices*, Renewable Energy World.com (Oct. 29, 2009), accessed at http://www.renewableenergyworld.com/rea/news/article/2009/10/how-to-compare-powergeneration-choices. Accession No. ML11294A595.

8. National Environmental Policy Act of 1969 (NEPA), as Amended. 42 U.S.C. 4321 et seq.

9. *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87, 95-96 (1st Cir 1978).

10. *Public Service Company of New Hampshire, et al.* (Seabrook Station Units 1 and 2), ALAB-471.

11. Nuclear Regulatory Commission (NRC). 1998. Regulatory Guide (RG) 4.7, *General Site Suitability Criteria for Nuclear Power Stations*, Revision 2. Accession No. ML003739894.

12. Nuclear Regulatory Commission (NRC). 2000. *Environmental Standard Review Plan — Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Vol. 1. Washington, D.C. Includes 2007 revisions.

13. Nuclear Regulatory Commission (NRC). 2005. U.S. Nuclear Regulatory Commission (NRC), Memorandum and Order (CLI-05-29) in the Matter of Exelon Generation Company, LLC. (Early Site Permit for Clinton ESP Site), December 12, 2005. Docket No. 52-007-ESP, Washington, D.C. Accession No. ML053460102.

14. Nuclear Regulatory Commission (NRC). 2009. U.S. Nuclear Regulatory Commission (NRC), Memorandum and Order (CLI-09-21) In the Matter of Duke Energy Carolinas, LLC, and Tennessee Valley Authority. (Combined License Application for Williams States Lee III Nuclear Station, Units 1 and 2 and Bellefonte Nuclear Power Plant, Units 3 and 4), November 3, 2009. Docket Nos. 52-014-COL, 52-015-COL, 52-018-COL, 52-019-COL. Accession No. ML093070689.

15. Nuclear Regulatory Commission (NRC). 2010a. *Supplemental Staff Guidance to NUREG-1555, "Environmental Standard Review Plan," (ESRP) for Consideration of the Effects of Greenhouse Gases and of Climate Change*. Accession No. ML100990204.

16. Nuclear Regulatory Commission (NRC). 2010b. *Supplemental Staff Guidance for Cumulative Effects Analysis*, Enclosure 2, *Cumulative Impacts of the Project at Alternative Sites*. Accession No. ML100621042.

17. Nuclear Regulatory Commission (NRC). 2011. *Environmental Impact Statement for Combined Licenses (COLs) for South Texas Project Electric Generating Station Units 3 and 4*, Final Report, Section 9.2.1. Accession No. ML11049A000.