



# U.S. NUCLEAR REGULATORY COMMISSION

## ENVIRONMENTAL STANDARD REVIEW PLAN

### 9.3 SITE SELECTION PROCESS

#### REVIEW RESPONSIBILITIES

Primary—Organization responsible for the review of alternatives analysis

Secondary—None

#### I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's analysis and evaluation of alternatives to the applicant's proposed site for the construction and operation of a nuclear power plant. Figure 9.3-1 shows the site selection process discussed below. Read Regulatory Guide (RG) 4.2 section 9.3 for the detailed guidance provided to the applicants on the site selection process. The reviewer should using their professional judgement be able to justify why deviations from the RG still result in a thorough site selection process. The scope of the review directed by this plan should include the analysis and evaluation of the applicant's process and results related to the selection of the region of interest, candidate areas, potential sites, candidates sites, and the selection of the proposed site, and a reasonable number of alternative sites from among the candidate sites. The review should also include the staff's independent comparison of alternative sites with the applicant's proposed site to determine if there are any alternative sites that are environmentally preferable to the proposed site. When one or more environmentally preferable alternative sites are identified, the scope of this review should be extended, using benefit-cost techniques and other procedures to determine if any environmentally preferable site can be shown to be obviously superior to the applicant's proposed site.

#### Definitions

"Region of interest" (ROI) is the geographic area considered in searching for potential and candidate sites. The geographic area of the ROI need not be contiguous, but if not, a logical basis for nonadjacent areas should be provided. "Candidate Areas" refers to one or more areas within the ROI that remain after unsuitable areas (e.g., due to high population, lack of water, fault lines, distance to transmission

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#### USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

This Environmental Standard Review Plan, NUREG-1555, has been prepared to establish guidance for the U.S. Nuclear Regulatory Commission staff responsible for environmental reviews for nuclear power plants. The Environmental Standard Review Plan is not a substitute for the NRC's regulations, and compliance with it is not required.

These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-1555 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of New Reactors, Washington, D.C. 20555-0001.

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lines) have been removed. “Potential Sites” are those sites within the candidate areas that have been identified for preliminary assessment in establishing candidate sites. “Candidate sites” are those potential sites (at least four) that are within the ROI and that are considered in the comparative evaluation of sites to be among the best that can reasonably be found for the siting of a nuclear power plant. The candidate sites include the proposed site and the alternative sites. The “proposed site” is the candidate site submitted to the NRC by the applicant as the proposed location for a nuclear power plant. “Alternative sites” are those candidate sites that are compared to the proposed site to determine if there is an obviously superior site. An “environmentally preferred” alternative site is a site for which the environmental impacts are sufficiently less than for the proposed site so that environmental preference for the alternative site can be established.

The review should be directed to the identification of sites suitable for the size and type of nuclear power plant proposed by the applicant. Plant design modifications (e.g., cooling system design) may be considered on a site-specific basis.

#### Review Interfaces

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

- ESRP 2.1. Obtain maps, photographs, and descriptions about the proposed site and surrounding area.
- ESRPs 2.2 through 2.8. Obtain input from the reviewers for information pertinent to a review of alternative power plant siting.
- ESRPs in 4.1 through 4.5 and in 5.1 through 5.9. Obtain relevant environmental impact estimates from the reviewers.
- ESRP 9.2.3. Provide information gathered on alternative sites.
- ESRP 10.4.3. Provide the results of the evaluation of these data for further analysis.

#### Data and Information Needs

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

(1) A description of the applicant’s site-selection process, including

- objectives of the site-selection process (from the environmental report [ER])

- siting constraints and limitations (e.g., rules, regulations, and laws) (from the ER and consultations, as appropriate, with relevant state public utility and power plant siting agencies)
- selection procedures for the ROI, candidate areas, potential sites, candidate sites, and proposed site (from the ER)
- basis for establishing the geographical scope of the ROI (from the ER)
- factors considered at each level of the selection process, parameters by which these factors were measured, and criteria used to define levels of quality (e.g., numerical limits or decision standards) (from the ER)<sup>(a)</sup>
- criteria used to screen potential sites to arrive at candidate sites (from the ER)
- methodologies used in the candidate site comparison process, including (when used) factors such as (1) importance factors, (2) preference functions, (3) utility functions, (4) weighting factors, (5) ranking scales, (6) scoring schemes, (7) rating systems, and (8) sensitivity analyses (from the ER).

(2) A description of the ROI selected by the applicant, including (from the ER):

- major centers of population
- areas predicted to be deficient in power
- water bodies available for cooling
- railroads, highways, and waterways (existing and planned)
- topographic features
- major land-use classifications (e.g., residential, agricultural) and areas reserved for specific uses
- location and description of existing and planned primary electrical generating stations
- existing and planned transmission network
- transmission interconnections with other utilities
- natural and man-made features (e.g., zones of seismic activity, unusual geologic features, military installations) constituting potential hazards to construction or operation of a nuclear power plant.

These data should be supported by maps of adequate scale and detail.

(3) Descriptions of the following (from the ER):

- candidate areas
- potential sites
- candidate sites.

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(a) See Appendix A to this ESRP for a representative checklist of selection process factors.

- (4) Descriptions of how the process described in Item 1 above was used to identify and select the items under (2) and (3) above (from the ER).
- (5) Data sources used in the applicant's site-selection process, including results of site-specific field investigations (from the ER).

## II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of alternative sites are based on the relevant requirements of the following:

- 10 CFR 51.45 with respect to the contents of an ER and the need to discuss alternatives
- 10 CFR 51.50(b) or (c) with respect to the evaluation of alternative sites in the ER for early site permit or combined license applications, respectively
- 10 CFR 51.71 with respect to discussion of alternatives in draft NRC environmental impact statements
- 10 CFR 51.75(b) or (c) with respect to review of early site permit or combined license applications, respectively, to determine whether there is any obviously superior alternative to the site proposed
- 10 CFR 51, Appendix A, with respect to alternatives including the proposed action
- Federal, State, local, and Native American Tribal laws and regulations affecting the siting of new energy facilities

Regulatory positions and specific criteria necessary to meet the acceptance criteria include:

- Regulatory Guide 4.2, Rev. 2, *Preparation of Environmental Reports for Nuclear Power Stations* (NRC 1976), with respect to selecting suitable plant sites.
- Office of Nuclear Reactor Regulation (NRR), Office Instruction No. LIC-203, Revision 1, "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues."
- Regulatory Guide 4.7, Rev. 2, *General Site Suitability for Nuclear Power Stations* (NRC 1998), with respect to evaluating site selection in terms of ecological systems, biota, and environmental justice

## Technical Rationale

The technical rationale for evaluating the applicant's site selection process is Section 102(2)(C) (iii) of the National Environmental Policy Act (NEPA) which requires that an EIS discuss alternatives to the proposed action.

The consideration of alternatives is the essence of the NEPA process. The review conducted under this ESRP section contributes to the consideration of alternatives by addressing alternative sites to determine if there is an obviously superior site in terms of environmental impacts and economic costs when compared to the proposed site. The standard of obvious superiority "...is designed to guarantee that a proposed site will not be rejected in favor of a substitute unless, on the basis of appropriate study, the Commission can be confident that such action is called for". See *Public Service Co. of New Hampshire (Seabrook Station, Units 1 & 2)*, CLI-77-8, 5 NRC 503, 526 (1977), *aff'd*, *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87, 95-96 (1st Cir 1978). A proposed site may not be rejected in favor of an alternative site when the alternative is "marginally better" than the proposed site, but only when it is "obviously superior". See *Rochester Gas & Electric Corp. (Sterling Power Project Nuclear Unit No. 1)*, ALAB-502, 8 NRC 383, 397 (1978), *aff'd*, CLI-80-23, 11 NRC 731 (1980). In addition, NEPA does not require that a nuclear plant be constructed on the single best site for environmental purposes. Rather, "...[a]ll that NEPA requires is that alternative sites be considered and that the effects on the environment of building the plant at the alternative sites be carefully studied and factored into the ultimate decision". See *Public Service Co. of New Hampshire (Seabrook Station, Units 1 & 2)*, CLI-77-8, 5 NRC 503, 526 (1977), *aff'd*, *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87 (1<sup>st</sup> Circuit 1978).

### III. REVIEW PROCEDURES

This review should accomplish the following objectives: (1) a brief description and evaluation of the applicant's site selection process, (2) presentation of the basis for the staff analysis, and (3) presentation of staff conclusions regarding alternatives to the proposed site. The fact that State authorities have approved the environmental acceptability of a site or a project after extensive and thorough environmentally sensitive hearings is properly entitled to "substantial weight" in this review.

The staff's analysis of alternative sites is a critical element of the environmental review. Under the general guidance and direction of the EPM, the reviewer<sup>(a)</sup> should analyze the applicant's site selection process and procedures. The subsections that follow explain the review process for (1) the ROI, (2) the candidate areas, (3) the potential sites, (4) the candidates sites, and (5) the proposed and alternative sites, in turn. The overall goal of the review is to understand the applicant's site-selection methodology so that

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(a) The environmental review of alternative sites can potentially include all major aspects of environmental impacts of construction and operation, economic costs, and safety considerations. Accordingly, the activities and inputs of reviewers for all of the above technical disciplines should be required in the conduct of this review. "Reviewer," as used in this ESRP, refers to any discipline that may be affected.

an eventual evaluation can be made of the reasonableness and capability of this process to identify candidate sites that are among the best that can reasonably be found in the ROI.

The reviewer's evaluation of the individual elements of the applicant's site-selection process should include consideration of both the process (i.e., methodology) used by the applicant and the reasonableness of the product (e.g., potential sites) identified by that process.

After the candidate sites have been identified, the review involves a two-part sequential test for obvious superiority. The first stage of the test determines whether there are environmentally preferred sites among the alternative sites. The second stage of the test considers economics, technology, and institutional factors among the environmentally preferred sites to see if any is obviously superior to the proposed site. If there is no environmentally preferred or obviously superior site, the proposed site prevails. If an environmentally preferred site is found, the reviewer should consult with the Environmental Project Manager (EPM). A staff conclusion that an alternative site is obviously superior to the applicant's proposed site would normally lead to a recommendation that the application be denied.

The following general guidance is provided for the reviewer in arriving at conclusions:

- The reviewer should determine if the applicant has employed a practicable site-selection process with the principal objective of identifying candidate sites that would be among the best that could reasonably be found for the proposed plant. This standard implies that all such candidate sites should be licensable (which includes consideration of whether other necessary Federal, State, and local permits could be obtained). The reviewer should determine if the applicant's proposed site was selected from this list of candidate sites. The reviewer should determine whether the reconnaissance-level information used throughout the site-selection process was complete enough and of sufficient depth commensurate with the level of screening to support the decisions that were made.
- The reviewer should determine if the applicant's candidate sites represent among the best that could reasonably have been found within the ROI, and if they do not, should request further information from the applicant. If the sites are among the best that could be found, the reviewer should determine if any such site is environmentally preferable to the applicant's proposed site. When such a determination is made, the reviewer should conduct a benefit-cost balance and comparison of the estimated costs (environmental, economic, and time) of completing construction of the proposed plant at the proposed site and at the environmentally preferable site or sites. The reviewer should use the results of this benefit-cost balance to determine if any environmentally preferable site can be shown to be obviously superior to the applicant's proposed site.

The reviewer should use the following specific guidance during the review:

#### Objectives and Procedures

The reviewer should ensure that the applicant's site-selection process was based on a documented procedure that includes as a minimum those elements described below.

### Region of Interest

Review and analyze the ROI selected by the applicant so that an eventual evaluation of the appropriateness (e.g., in terms of geographical, demographic, legal, regulatory, and institutional restrictions) of the selected region can be made.

The ROI is typically selected based on geographic boundaries (e.g., the State in which the proposed site is located) or the relevant service area for the proposed plant. In cases where the proposed plant would not have a service area, the applicant should define a reasonable ROI and provide a justification. The ROI must be more extensive if environmental diversity would be substantially improved or if candidate sites do not meet initial threshold criteria (including the site criteria in 10 CFR 100), and added geographic areas likely would not increase costs substantially. The ROI may be smaller if sufficient environmental diversity exists, threshold criteria are satisfied, and costs would be exorbitant for considering sites outside the State or relevant service area.

The reviewer should ensure that the selected ROI has been adequately described and that its boundaries are consistent with those factors outlined in the preceding paragraph. In making this determination, the reviewer should consider (1) how the applicant's ROI compares with the available geographical area, (2) the extent of and basis for restrictions to the ROI because of siting constraints, and (3) whether the ROI is consistent with the major load centers to be supplied by the proposed plant. As a general rule, the plant should be located at a site in the area of the load center or centers that the plant is to serve over its lifetime. The reviewer should determine if the selected ROI will permit such siting and that potentially desirable candidate areas have not been excluded on the basis of an arbitrarily defined ROI.

### Process for Identifying Candidate Area(s)

Review and analyze the candidate area(s) selected by the applicant so that an eventual evaluation of the appropriateness (e.g., in terms of safety considerations, prohibited areas, geographic or engineering restrictions, and environmental restrictions) of the selected candidate area(s) can be made.

The candidate area(s) are a subset of the ROI, after unsuitable areas in the ROI are removed from consideration. Reasons that areas may be unsuitable include:

- proximity to major centers of population density
- lack of existing infrastructure (e.g., roads, railroads)
- lack of a suitable cooling water source
- distance to transmission lines, substations, or load centers
- unsuitable topographic features (e.g., mountains, marshes, fault lines)

- potential to impact valuable agricultural, residential, or industrial areas
- potential to impact dedicated land-use areas (e.g., parks, historical sites, wilderness areas, testing grounds)
- conflicts with land-use planning programs or other restrictions established by State, county, or local governments

The applicant's process to identify candidate areas should consider these and other reasonable attributes in order to identify areas that are, or are not, potentially suitable for siting a new nuclear power plant. Only the determining characteristics of the identified areas need be presented in the ER. For example, if an area has no suitable cooling water source, then the area would be considered unsuitable and the other factors listed above need not be considered. This step of the site selection process is performed at a high level with the purpose of quickly identifying areas within the ROI that would not be suitable for the siting of a new nuclear power plant.

#### Process for Identifying Potential Sites

Analyze the reconnaissance-level information available on Geographical, Environmental, and Siting Information System (GEN&SIS) or from other sources used in this portion of the site-selection process so that an eventual evaluation can be made of whether the information is adequate for the level of screening for which it is used.

Review the potential sites identified by the applicant so that an eventual evaluation can be made with respect to (a) adequacy of the site-identification process, and (b) consistency with the applicant's criteria for site selection.

The process used to identify potential sites considers attributes similar to those used in the process of identifying candidate areas. However, in general this step in the process requires a somewhat more detailed look at those criteria. In addition, in many cases the applicant will use the inverse of the attributes listed above, looking for positive rather than negative attributes. So, for example, the applicant would be looking for locations in the candidate area(s) that have ample water, are close to transmission facilities and load centers, have infrastructure in place, etc. However, negative attributes at a specific location (e.g., seismicity, threatened and endangered species) likely will also be used to de-select some sites.

The goal of this step in the process is not to identify every potential site in the candidate area(s). Depending on the size of the candidate area(s), trying to identify all possible sites would yield an unworkable number of possible locations. However, the staff needs to determine whether the applicant used a logical process that would reasonably be expected to produce a list of the best potential sites in the candidate area(s).

### Process for Identifying Candidate Sites

Analyze the reconnaissance-level information available on Geographical, Environmental, and Siting Information System (GEN&SIS) or from other sources used in this portion of the site-selection process so that an eventual evaluation can be made of whether the information is adequate for the level of screening for which it is used.

Analyze the applicant's candidate sites to the level needed to conclude that they are or are not potentially licensable sites and to identify the potential environmental impacts (adverse and beneficial) attributable to each site that would be used (a) by the applicant to select the proposed site, and (b) by the reviewer to determine the possible existence of an obviously superior site.

The reviewer should analyze the applicant's site selection criteria from the viewpoint of their applicability to a wide variety of candidate sites and their value in permitting comparisons of potential impacts.

The reviewer should determine if the selection process used to identify candidate sites was adequate. Sites may be selected on the basis of a screening process to identify unacceptable areas (e.g., population density) or on the basis of positive attributes. A table similar to Table 9.3-1 may be used by the reviewer to document the process of candidate site selection and screening. The reviewer should ensure that factors identified below have been considered by the applicant .

To be a candidate site, the following minimum criteria must be met:

- Consumptive use of water should not cause significant adverse effects on other users.
- The proposed action should not jeopardize Federal, State, and affected Native American tribal listed threatened, endangered, or candidates species or result in the destruction or adverse modification of critical habitat.
- There should not be any potential significant impacts to spawning grounds or nursery areas of populations of important aquatic species on Federal, State, and affected Native American tribal lists.
- Discharges of effluents into waterways should be in accordance with Federal, State, regional, local, and affected Native American tribal regulations and would not adversely impact efforts to meet water-quality objectives.
- There should be no preemption of or adverse impacts on land specially designated for environmental, recreational, or other special purposes.

- There would not be any potential significant impact on terrestrial and aquatic ecosystems, including wetlands, which are unique to the resource area.
- There are no other significant issues that preclude the use of the site.

The reviewer should determine if an adequate, well documented process for screening potential sites was employed, and that all potential sites were screened in a consistent manner. The reviewer should consider all screening criteria employed by the applicant in light of the objective of this process (i.e., to identify potentially licensable sites). The reviewer should compare the applicant's procedures with the recommendations of Regulatory Guide 4.7 and, when inconsistent, should coordinate with the EPM to determine the reasons for the variances.

Based on reconnaissance level information, the reviewer should determine if the candidate sites identified by the screening process may be considered as potentially licensable and should also determine that the applicant's process provides reasonable assurance that potentially licensable candidate sites have not been omitted. Although there can be no specific criteria for determining that an adequate number of candidate sites have been identified, the reviewer should make such a determination, based on the ROI, the number of candidate areas, and the number and type of alternative sites evaluated by the applicant. In general, however, the identification of two or more different areas and three to five alternative sites in addition to the proposed site could be viewed as adequate.

#### Proposed and Alternative Sites

The objective of this phase of the evaluation procedure is (1) to determine if the applicant has reasonably identified alternative sites<sup>(a)</sup>, predicted the environmental impacts of construction and operation at these sites, and developed and used a logical, reproducible means of comparing sites that has led to the applicant's selection of the proposed site, and (2) to determine if any alternative site can be shown to be environmentally preferable, and if so, obviously superior to the applicant's proposed site. This analysis may be documented in a table such as Table 9.3.2, which records summary environmental information on each alternative site; the conclusion of environmental preferability for any sites; consideration of other factors; and any identification of an obviously superior site. Costs associated with alternative sites only need to be evaluated for alternative sites found to be environmentally preferable to the proposed site. Many of the following evaluation steps must be based on the reviewer's judgment. For these evaluations, the principal criterion will be the reasonableness of the applicant's data and procedures. The reviewer should make the following determinations:

- Site Identification—The reviewer should determine that the alternative sites have been identified with sufficient precision to permit field inspections and to estimate environmental parameters. If the applicant is unable to provide precise alternative site boundaries, and if the reviewer

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(a) The alternative sites are those candidate sites that remain after the proposed site is selected (i.e., candidate sites - proposed site = alternative sites).

determines that the reasons for this are valid, the reviewer should evaluate the general site area instead.

- **Environmental Descriptions**—The reviewer should determine that environmental descriptions for the alternative sites are adequate to assess environmental impacts of plant construction and operation, and that the basic sources of information described below have been used to provide these data:
  - review of the literature
  - reports from Federal, State, regional, local, and affected Native American tribal agencies such as State geological agencies, EPA, U.S. Department of Agriculture, or county extension offices
  - regional scientific, engineering, economic, and planning studies
  - aerial photographs and topographic maps of candidate sites
  - site-specific information from local citizens and from authorities associated with Federal, State, regional, local, and affected Native American tribal agencies, universities, and museums
  - onsite inspections (if any) by technical specialists.
- **Site Comparison by Applicant**—The reviewer should determine that the applicant's final site-selection process is reasonable, makes full use of the candidate site data available, and presents the data in a manner that permits valid comparisons between sites. The objective of this evaluation of the applicant's process is not to determine that the applicant has selected the best site (since on the basis of previous evaluations, the reviewer has determined those candidate sites that can reasonably be expected to be licensable), but is to determine if any candidate site can be judged as environmentally preferable and, if so, obviously superior to the applicant's proposed site. The criterion for making this determination is that one or more important aspects, either singly or in combination, of a reasonably available alternative site are obviously superior to the corresponding aspects of the applicant's proposed site, and the alternative site does not have offsetting deficiencies. The reviewer should consider how the impact data used in the comparison were obtained, how they were applied to each candidate site, and how the comparisons between sites were made. As a general rule, the EPM and specific reviewers for key technical disciplines should make an onsite inspection of each alternative site identified in the application.

Recognize that there will be special cases in which the proposed site was not selected on the basis of a systematic site-selection process. Examples include plants proposed to be constructed on the site of an existing nuclear power plant previously found acceptable on the basis of a

NEPA review and/or demonstrated to be environmentally satisfactory on the basis of operating experience, and sites assigned or allocated to an applicant by a State government from a list of State-approved power-plant sites. For such cases, the reviewer should analyze the applicant's site-selection process only as it applies to candidate sites other than the proposed site, and the site-comparison process may be restricted to a site-by-site comparison of these candidates with the proposed site. The site selection process is the same for this case except for the fact that the proposed site is not selected from among the candidate sites based on a site by site comparison.

- Site Comparison by Staff—The reviewer will use information regarding the environmental impacts of the proposed action at the proposed site that were developed in Chapters 4.0 and 5.0, and the reconnaissance level information available for the alternative sites, to perform an independent comparison of the proposed and alternative sites.

The reviewer should consider the following topics in comparing the proposed and alternative sites:

- hydrology, water quality, and water availability
- aquatic biological resources, including wetlands, wetland buffers, essential fish habitat, and endangered species
- terrestrial resources and land uses, including endangered species, and areas requiring special consideration
- transmission corridors
- socioeconomic factors, including aesthetics, archaeological and historic preservation, and environmental justice
- population distribution and density
- air quality
- radiological and non-radiological health impacts
- postulated accidents.

In some cases the reviewer may find that certain impact categories may not vary among the proposed and alternative sites and, as a result, would not affect the evaluation of whether an alternative site is environmentally preferable to the proposed site. In these cases, impacts can be discussed generically. The reviewer should determine how environmental and health impact information was used by the applicant to predict site-specific impacts, and how the impacts were assembled for a site-to-site comparison.

The reviewer will normally use the applicant's proposed plant and supporting system designs at the proposed and alternative sites for the purposes of the comparison. However, in some cases the reviewer may consider alternative systems at the alternative sites. For example, if the specific cooling water system design proposed by the applicant cannot be used at an alternative site, but there is a clearly feasible alternative cooling system design that would work, the reviewer should use the alternative cooling system design. This approach should be used sparingly and only in cases in which the proposed system cannot be used to maintain a manageable range of alternatives. This approach should only be used for systems that have a significant impact on the environment.

If one or more environmentally preferable alternative sites are identified, then the reviewer must determine whether any environmentally preferable 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. The factors to be considered include:

- facility costs for any sites identified as being environmentally preferable
- institutional constraints, as they affect site availability
- additional public concerns.

To the extent practical the reviewer should place the factors being considered into common terms (e.g., monetary cost or benefit). However, in a number of cases it won't be practical to do this and the reviewer will have to use judgment to reach a conclusion regarding whether an alternative site is obviously superior to the proposed site. In using judgment, the reviewer must document the basis for the conclusion so that it can be readily understood by those who will review the evaluation (e.g., a licensing board or the Commission).

Because reviewer judgment is required for the decision that a site attribute is obviously superior, any such conclusion must be supported by the corresponding ESRP Chapters 2.0, 4.0, and 5.0 reviewers. The reviewer need not establish or confirm a relative ranking of candidate sites, but must determine by means of one-by-one comparisons that no alternative site is obviously superior to the proposed site.

When the reviewer determines that an obviously superior site can be identified, the reviewer should consult with the applicant to determine the applicant's reasons (if not already known) for not selecting the obviously superior site. In addition, the reviewer should document the conclusion that an alternative site is obviously superior to the proposed site. Finally, the reviewer should alert the EPM to this finding.

- Impact Predictions—The reviewer should determine that basic impact criteria (e.g., land use, water use) have been developed for each alternative site, using the environmental descriptions

established by the applicant and considering the basic construction and operational parameters of the proposed plant.

- Cost Data—If needed to determine whether an environmentally preferable alternative site is obviously superior to the proposed site, the reviewer should determine that economic-cost data associated with each alternative site have been provided, are reasonable, and permit comparison between the candidate sites.

Analyze the candidate-site evaluation procedure in the detail needed to be able to make an eventual evaluation that no site within the appropriate study area can be judged (by this or by any other acceptable and accurate procedure based on reconnaissance level data) to be obviously superior to the applicant's proposed site.

#### IV. EVALUATION FINDINGS

The following information should be provided for the EIS in a summary format:

##### (1) Applicant's Site-Selection Process

- a description of the applicant's documented site-selection process methodology, including a summary of the process objectives
- a description of the selected ROI and the candidate area(s)
- a description of the potential sites identified
- a description of the process used to screen from potential sites to candidate sites
- a list and general description of the candidate sites
- a discussion of how the proposed site was identified and compared to the alternative sites

##### (2) Staff Analysis

- a description of the process used by the staff to review the applicant's methodology
- the staff's evaluation of the selected ROI and candidate area(s)
- the staff's evaluation of the identification of potential sites
- the staff's evaluation of the process used to screen from potential sites to candidate sites
- the staff's evaluation of the applicant's comparison of the proposed and alternative sites
- the staff's independent comparison of the proposed and alternative sites.

##### (3) Staff Conclusions

- conclusions with respect to the applicant's methodology
- conclusions with respect to the reconnaissance level information
- conclusions with respect to the applicant's selection criteria

- conclusions with respect to the applicant's selection process for the:
  - ROI
  - candidate area(s)
  - potential sites
  - candidate sites
  - proposed site
- conclusions with respect to the objective to identify candidate sites that are among the best that could reasonably have been found in the ROI
- conclusions with respect to the identification of an environmentally preferable or obviously superior site.

For reviews related to CP, COL, and early site permit applications, the reviewer verifies that sufficient information has been provided and that the NRC staff evaluation supports concluding statements of the following type to be included in the EIS:

The staff reviewed the available information on the proposed and alternative sites. Based on this review, the staff concludes that the alternative sites are not environmentally preferable to the proposed site under consideration. Since there are no environmentally preferable alternative sites, it follows that there are no obviously superior alternative sites.

If after the evaluation, the conclusion is reached that one or more of the alternative sites under consideration is environmentally preferable to the proposed site, but none is determined to be obviously superior, a statement similar to the following should be included:

The staff reviewed the information submitted by the applicant. Based on this review, the staff concludes that the one [or more] of the alternative sites is environmentally preferable to the proposed site. However, based on the comparison of costs and institutional and other factors, the staff concludes that none of the alternative sites is obviously superior to the proposed site.

If after the evaluation, the conclusion is reached that one of the alternative sites under consideration should be the proposed site, a statement similar to the following should be included, followed by a list of the areas in which the alternative site is a better choice:

The staff reviewed the information submitted by the applicant. Based on this review, the staff concludes that the analysis does not adequately support the proposed site in that an obviously superior alternative site has been identified. The staff finds the proposed site deficient in the following areas... when compared to the alternative site.

## V. IMPLEMENTATION

The method described in this ESRP should be used by the staff in evaluating conformance with NRC requirements, except in those cases in which the applicant proposes an acceptable alternative for complying with specified portions of the requirements.

## VI. REFERENCES

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

10 CFR 51.45, "Environmental report."

10 CFR 51.50, "Environmental report—construction permit, early site permit, or combined license stage."

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

10 CFR 51.75, "Draft environmental impact statement—construction permit, early site permit, or combined license."

10 CFR 100, "Reactor Site Criteria."

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

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### PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Environmental Standard Review Plan are covered by the requirements of 10 CFR Part 51, and were approved by the Office of Management and Budget, approval number 3150-0021.

### PUBLIC PROTECTION NOTIFICATION

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

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**Table 9.3-1.** Selection of Candidate Sites

<b>Subject Areas for Candidate Site Selection and Screening</b>	<b>Site 1</b>	<b>Site 2</b>	<b>Site 3</b>
Land use, including availability, and areas requiring special consideration			
Hydrology, water quality, and water availability			
Terrestrial resources (including endangered species)			
Aquatic biological resources (including endangered species)			
Socioeconomics (including aesthetics, demography, and infrastructure)			
Environmental Justice			
Historic and Cultural Resources			
Air Quality			
Human Health			
Postulated Accidents <sup>(a)</sup>			
Fuel Cycle Impacts <sup>(a)</sup>			
Transmission corridors (land used, feasibility, and resources affected)			
Population distribution and density			
Facility costs			
Institutional constraints, as they affect site availability			
Additional public concerns			
(For candidate site selection) Is this site a candidate site? (Yes/No)			
(For candidate site screening) Is this candidate site a good alternative site to the proposed site? (Yes/No)			

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(a) This row only applies to impacts of operations.

**Table 9.3-2.** Evaluation of Alternative Sites

<b>Topic Areas for Evaluation of Alternative Sites</b>	<b>Proposed Site</b>	<b>Alternative Site 1</b>	<b>Alternative Site 2</b>	<b>Alternative Site 3</b>
Land use, including transmission corridors and impacts on areas requiring special consideration				
Hydrology, water quality, and water availability				
Terrestrial resources (including endangered species)				
Aquatic biological resources (including endangered species)				
Socioeconomics (including aesthetics, demography, and infrastructure)				
Environmental Justice				
Historic and Cultural Resources				
Air Quality				
Human Health				
Postulated Accidents <sup>(a)</sup>				
Fuel Cycle Impacts <sup>(a)</sup>				
Is site environmentally preferable to proposed site? (Yes/No) <sup>(b)</sup>				
Facility costs				
Institutional constraints, as they affect site availability				
Additional public concerns				
Is site obviously superior to the proposed site? (Yes/No)				

(a) This row only applies to impacts of operations.

(b) If none of the alternative sites is environmentally preferable to the proposed site, then the rows that follow may be left off the table.

## APPENDIX A

### EVALUATION FACTORS

#### Engineering and Environmental

Aesthetics  
Commitment of resources  
Demography  
Ecological sensitivity  
Geology  
Hydrology  
Meteorology  
Seismicity  
Socioeconomics  
Transportation access

#### Land Use

Agriculture  
Dedicated areas  
Industry  
Land availability  
Land-use planning  
Recreational usage

#### Water Use

Water accessibility  
Water availability  
Water quality

#### Institutional

Federal restrictions  
Local/regional/Tribal restrictions  
State restrictions

#### Construction

Equipment and materials handling  
Work-force availability and accessibility  
Work-force housing

#### Cost

Access roads and railways  
Construction costs  
Cooling system  
Fuel costs  
Intakes and discharges  
Land and water  
Operating and maintenance costs  
Site preparation  
Station facilities  
Transmission and substations

#### Transmission

Access to existing network  
New corridors  
Reliability  
Transmission losses

Figure 9.3-1 Site Selection Process

