



U.S. NUCLEAR REGULATORY COMMISSION
**ENVIRONMENTAL STANDARD
 REVIEW PLAN**

8.1 DESCRIPTION OF POWER SYSTEM

REVIEW RESPONSIBILITIES

Primary— Organization responsible for the review of economic information

Secondary— None

I. AREAS OF REVIEW

The need for power is a critical component of an EIS as it establishes a framework for evaluation of project benefits and for the geographic boundaries over which benefits and costs are distributed. This ESRP discusses the proposed project in the context of the larger network of transmission and generation and the loads the system serves. ESRP 8.2 discusses demand and demand growth in the region, and ESRP 8.3 discusses power supply options.

The primary benefit of a new nuclear plant is the large quantity of baseload power it may provide. New power plants may be needed to meet growing loads and to replace plants that are retired. The need for new plants also has a geographic component, as power may be needed at specific locations on the interconnected power grid to ensure reliability of the entire power grid or of subsections of the grid. The geographic scope for the need for power may be defined in the application by a utility service area, but it also exists in a larger geographic context because power from the plant will flow outside a relevant utility service area boundary. This larger area is the relevant market area. The boundary of the relevant market area is primarily a function of the way the transmission system is planned and managed. This has both electrical and economic features, which requires further description to facilitate evaluation of an application and other materials staff may consult.

Wholesale power supply continues to be deregulated nationwide. Firms that do not serve retail customers may build and operate power plants. Power from any power plant may be sold to utilities and others using the regional transmission system. Management and operation of utility transmission is performed on a regional basis to support regional power exchanges through competitive power markets.

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USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

This Environmental Standard Review Plan 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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Some parts of the country have formed regional transmission operators (RTOs) or independent system operators (ISOs) to provide regional transmission planning and management and to operate wholesale power markets. Where these exist, they define the relevant market area for a proposed project. In addition to RTOs/ISOs, the United States is divided into unique regional electricity reliability councils by the North American Electric Reliability Corporation (NERC). Each regional council has responsibility for managing system reliability within their respective region by monitoring the balance between customer demand and generation. As a result, the local NERC region may be the relevant market area when RTOs/ISOs do not exist. It should also be noted that high voltage transmission interties enable power exchanges between NERC regions and RTOs/ISOs, although these exchanges are primarily governed by sales contracts.

The determination of the need for new generation requires evaluation of both utility supplies compared to projected demand, and demand in the relevant service and market areas. The applicant may provide or NRC staff obtain information from sources that encompass different geographic areas. Therefore NRC staff must be specific about what area they are referencing, such as utility service area, State, RTO/ISO area or regional market, NERC region, or other area if appropriate.

This ESRP directs the staff's description of the power system as it presently exists, including both service areas and regional relationships (e.g., regional wholesale power markets and institutions, power pool agreements, electrical transfer capabilities and congested transmission corridors, diversity interchange agreements, wheeling contracts, etc.).

The scope of the review directed by this plan should include a description of (1) the service and market area or areas, (2) the number and types of customers and major electrical load centers to be served by the proposed project, and (3) system factors that are unique to the power system, including status of retail deregulation, operating regional transmission organizations and associated power markets and the role and capacity of interregional transmission interties. This review will provide input to the reviews conducted under ESRPs 8.2, 8.3, and 8.4.

In performing this review, the reviewer may rely on the analysis in the applicant's environmental report (ER) after ensuring it is consistent with all available State or regional authorities' or RTO/ISO analyses, including appropriate regional NERC councils.

Reviewers of issues related to the need for power should identify any applicable NRC guidance before beginning their review.

Review Interfaces

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

- ESRPs 8.2.1 and 8.2.2. Identify and provide information on any anomalies in the relevant service and market areas that may affect energy and peakload demand forecasts (e.g., an extremely large

industrial customer or market conditions that may affect inter- and intra-regional power flows, such as low cost power from the Ohio Valley flowing east into markets in Pennsylvania and the Atlantic states or access to current or proposed inter-regional transmission interties).

- ESRP 8.3. Provide a list of factors that may affect power supply, such as diversity interchange agreements among adjacent regions, wheeling arrangements, chronic transmission congestion, etc.
- ESRP 8.4. Provide a list of power pooling agreements as they might impact reserve margin criteria.
- ESRP 9.1. Provide a list of factors that might encourage or impede the possibility of purchasing electrical power rather than installing new generating capacity.
- ESRP 9.3. Identify and provide information on the geographical boundaries of the applicant's relevant service and market areas.

Data and Information Needs

Affected States and/or regions may prepare a need-for-power evaluation as part of a State or regional energy planning exercise. Similarly, State or regional agencies may require the applicant to document a need for power or plan for future plant construction. The applicant may choose to rely on those documents rather than prepare a description of the power system of its own. If so, NRC staff should review these documents to determine if they are (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. Of particular concern are third-party plans or reports restricted to boundaries smaller than relevant service and market areas. Another concern is plans and studies that do not extend far enough into the future to provide an adequate basis for comparison. If NRC staff conclude these other documents are acceptable, no additional independent review by NRC staff may be needed and that analysis can be the basis for ESRPs 8.2 through 8.4.

If NRC staff determine these documents are not acceptable, it may request additional information from the applicant, or it may supplement the information provided with information from other sources, such as the Energy Information Administration, the Federal Energy Regulatory Commission (FERC), NERC and applicable member councils, and others to ensure adequate geographic coverage.

The following data or information should be included in the materials used by the reviewer to assess the need for power, including those submitted by the applicant. Staff should have access to these as well and may have to obtain them if they are not provided in order to review the applicant's need-for-power analysis:

- a map indicating the geographical and political boundaries of the relevant service and market areas. The map should indicate major electrical load centers and major intertie-transfer capabilities with neighboring utility systems and relevant markets. If there are no specific system boundaries, the staff should obtain the best possible description of typical competitors and satisfy themselves that the proposed facility will be competitive in its market. At a minimum, the reviewer should place the

proposed facility within a specific NERC subregion and reference the reliability needs of that region. If the proposed facility is expected to service customers in adjacent NERC subregions, the review should extend to those areas as well, and address potential intra- and inter-regional transmission adequacy to support projected power transfers.

- The current population and the number and types of customers in the relevant service and market areas, associated loads, and fractions of that load served by the applicant.
- identification of the power pool or regional transmission organization(s) (if applicable) or alternative mutual assistance arrangements in which the applicant may be a participant, and the commitments of its members in terms of reserve margin requirements, planning, and joint ownership of generating capacity.

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of the power system are based on the relevant requirements of the following regulations

- 10 CFR 51, Appendix A(4), with respect to discussion of the no-action alternative in NRC EISs
- 10 CFR 51.71(d) with respect to weighing the costs and benefits of the proposed action and reasonable alternatives
- 10 CFR 51.75(b) and (c) with respect to applications for early site permits and combined licenses, respectively

Regulatory positions and specific criteria necessary to meet the regulations identified above are as follows:

- Regulatory Guide 4.2, Rev. 2, *Preparation of Environmental Reports for Nuclear Power Stations* (NRC 1976), with respect to a description of the existing power system.

Technical Rationale

The technical rationale for evaluating the applicant's description of the power system is discussed in the following paragraphs:

An understanding of the existing regional power system is needed to perform an independent evaluation of the need for power, to evaluate the no-action alternative and the proposed action, and to compare the proposed action with other alternatives. It is also needed to characterize the benefits associated with the proposed project.

The description of the power system should be adequate to permit an independent analysis of the need for power and alternatives when considered with other factors covered in ESRPs 8.2.1, 8.2.2, and 8.3.

III. REVIEW PROCEDURES

If an independent review of the description of the power system is to be conducted by NRC staff in lieu of using a review prepared by affected States and/or regions or ISO, the procedures discussed below should be followed. These procedures also may be used by the reviewer as an aid in evaluating studies, forecasts and resource plans prepared by others.

(1) Obtain the required information for this analysis from:

- the applicant's environmental report
- the applicant's annual report
- data filed by the applicant with FERC, the applicable State public utility commission, and/or the applicable State facility siting authorities, and data and studies filed by the applicant with the relevant NERC reliability council and regional transmission operator

(2) Examine the geographical boundaries of the applicant's service area, the power pool or regional transmission organization (if applicable), and the NERC electric reliability region and wholesale power market of which the applicant is a part. Determine the probable competitors for the proposed facility using whatever reputable power market analysis is available, including NERC region reliability assessments and regional transmission organization plans and interconnection requests.

- (a) Identify major electrical load centers on the map of the relevant service area and transmission paths and constraints to them from the proposed plant location.
- (b) Examine the current population and the number and types of customers in the relevant service area and fraction with access to competitive retail power suppliers and rates of "choice" within them.

(3) Identify the appropriate NERC electric reliability council region.

- (a) Examine any pertinent power pool and regional transmission operator agreements and reliability studies.
- (b) Examine the applicant's major power purchases/sales with neighboring utility companies and retail power suppliers.
- (c) Examine any wheeling or diversity interchange agreements and any current or proposed intertie agreements.

- (4) Ensure that the information and data derived from the analysis are adequate to serve as a basis for characterizing the applicant's service and market areas and relevant regional relationships.
 - (a) Identify any unusual features that affect subsequent evaluations of the need for power (e.g., large industrial customers or a noncontiguous service area).
 - (b) Ensure that these features are accounted for and have been explained.

IV. EVALUATION FINDINGS

The information and data obtained from this analysis should be organized into subsections as follows:

- A brief introductory paragraph that contains the name(s) of the applicant(s), the percentage share of the proposed plant that each applicant will own, the station name, the number of generating units proposed, the net electrical rating of each proposed unit, and the applicant's proposed month and year of initial commercial operation of each unit.
- A section that contains maps indicating the geographical and political boundaries of the relevant service area, the power pool and/or regional transmission organization(s) (if applicable), and the appropriate electric reliability and wholesale market region. The service-area map should indicate electrical transfer capabilities within the relevant service area (e.g., between the applicant and neighboring utilities and markets) and the major electrical load centers. The population to be served by the applicant should be stated along with the area of the system. Major types of customers should be identified as well as any atypical situations (e.g., an extremely large industrial customer). The primary types of industry and commerce for the region should also be identified.
- A section that contains a brief description of any relevant power pool, RTO/ISO, and appropriate electric reliability council(s). A brief discussion of any major existing or proposed power sales/purchases or diversity interchange agreements within the region should be included. If the applicant is a member of a power pool or regional transmission organization, a brief discussion should be presented regarding the legal commitments of the power pool members in terms of reserve margin requirements, planning, and sharing generating capacity.
- Describe the probable competitors for the proposed facility, based on any reputable analysis, and discuss the marketability of power from the proposed facility together with any significant market competitors and risks.

V. IMPLEMENTATION

The method described herein 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(4), “Purpose and need for action.”

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.”

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

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.
