



U.S. NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL STANDARD REVIEW PLAN

3.7 POWER TRANSMISSION SYSTEM

REVIEW RESPONSIBILITIES

Primary— Organization responsible for the electrical engineering reviews

Secondary— None

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's description of the design characteristics of the proposed power transmission system. The scope of the review directed by this plan should include the transmission system from the plant switchyard to its connections with existing systems, including lines, corridors,^(a) towers, access roads, substations, and communication stations. This review should provide input to other reviews dealing with evaluation of construction and operational impacts associated with land use and ecosystems and to other ESRPs that deal with consideration of alternatives.

Review Interfaces

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

- ESRP 1.2. Ensure that the reviewer of ESRP 1.2 includes approval for transmission towers extending more than 61 m (200 ft) above ground, if the applicant will construct or own the transmission lines connecting the plant to the power grid.

(a) For the purposes of these ESRPs, "corridors" are defined as transmission line routes of variable width, depending on the nature of the application. When an applicant has proposed precisely described and located rights-of-way, "corridor" and "right-of-way" are synonymous. When an applicant's rights-of-way are not precisely defined, corridors are more general routes of sufficient width to contain the eventual rights-of-way.

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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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- ESRP 2.2.2. Obtain land-use data as needed to support descriptions of transmission corridors and offsite areas.
- ESRP 2.5.3. Provide the locations of planned transmission corridors.
- ESRPs 4.1, 4.3.1, 4.3.2, 4.4.3, 5.1.2, 5.1.3, 5.6, and 5.8.3. Provide descriptive information to support the assessments related to power transmission.
- ESRPs 4.2.1 and 4.2.2. Provide information on the power transmission corridor as it relates to construction activities.
- ESRP 4.4.1. Provide a detailed description of any power transmission system construction associated with the proposed plant that physically impacts the region, including visual aesthetics.
- ESRPs 5.6.2, 6.5.1, and 6.5.2. Provide the physical characteristics of the power-transmission system and maintenance procedures necessary for determining environmental impacts to the aquatic ecosystems and provide any additional information pertinent to ecological monitoring programs.
- ESRP 5.6.3. Provide information about the compliance of any new or upgraded transmission lines with applicable standards and regulations.
- ESRP 9.2.1. Provide information on the power transmission system that is relevant to the evaluation of alternatives to the proposed action that do not require new generating capacity.
- ESRP 9.4.3. Provide background information on the proposed transmission system routing and design for the evaluation of power transmission system alternatives.

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:

- a description of the regional transmission system— who owns and operates the system, where are the major transmission lines, where are the potential intertie locations, and what are the basic electric design parameters (from the environmental report (ER)).
- a description of the interconnection between the plant and the regional transmission system— who will construct, own, and operate the transmission line from the power plant substation to the intertie substation (from the ER).

- identification of the permitting authority for transmission line construction, a description of the transmission line siting procedures that were or are to be followed, and a schedule for environmental reviews that will be conducted as part of the siting procedure (from the ER).
- the standards/procedures for the interconnection operation, and the right-of-way maintenance.
- identification of basic electrical design parameters, including transmission design voltage or voltages, minimum conductor clearances to ground, and the maximum induced current to ground from vehicles or obstacles under the transmission line (ER).
- predicted noise levels resulting from transmission-system operation (from the ER).
- topographic maps (15-minute scale as a rule) or aerial photographs showing the proposed corridor or corridors and all existing major high voltage corridors in the region. The applicant should provide siting data for all potential corridors.
- lengths, widths, and area of rights-of-way, including modification and/or use of existing rights-of-way and other facilities for the proposed project (from the ER).
- special use land areas that would serve as constraints in the selection of transmission line routing (from the ER).
- significant ecological resources, such as wetlands, critical habitats, and threatened or endangered species, in potential interconnection corridors (from the ER).
- significant cultural or historic resources in potential interconnection corridors.
- a description of land use limitations within the transmission line corridors.
- general methods of construction (e.g., tower foundations, stringing, location of access roads, span length, and clearing of rights-of-way) (from the ER).
- substation locations (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of power transmission line siting are based on the relevant requirements of the following:

- 18 CFR Part 35 with respect to the interconnection procedures (when applicable).

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), in which the level of detailed description for the construction and maintenance of these structures and their rights-of-way are identified.
- Institute of Electrical and Electronic Engineers, Inc. (current NESC) with respect to electric shock hazards.
- Applicable Federal, State, regional, local, and affected Native American tribal standards, guidelines, and requirements.

Technical Rationale

The technical rationale for evaluating the applicant's power transmission system is discussed in the following paragraph:

A description and characterization of the proposed transmission system is necessary to evaluate the environmental impacts associated with the system. Restrictions on property use in the proposed power transmission line corridor and sensitive habitats in its proposed path must be understood so that the impacts can be fully considered. Additionally, the design parameters of the system and the resulting field strengths and noise levels expected to be associated with power transmission provide useful information in addressing the significance of potential impacts.

III. REVIEW PROCEDURES

The reviewer's analysis of the proposed power transmission system should be closely linked with the impact assessment review described within ESRPs 4.1, 4.3.1, 4.3.2, 4.4.3, 5.1.2, 5.1.3, 5.6, and 5.8.3 to establish the general power transmission system characteristics that are most likely to affect these reviews.

Because this plan is primarily for description, the information can usually be obtained from the ER or from responses to questions asked of the applicant. When an applicant has identified a specific corridor or corridors as the proposed transmission line route or routes, only those corridors need to be considered in this review. (Alternative corridors should be considered by the reviewer for ESRP 9.4.3 on Alternative Transmission Systems.) If no specific corridors are identified, the reviewer should consider in this review all potential corridors identified by the applicant.

IV. EVALUATION FINDINGS

Evaluating the adequacy of this material requires the reviewer to determine that (1) data on the power transmission system are sufficient to describe the systems and provide qualitative and quantitative information necessary to assess potential impacts to land use, terrestrial and aquatic ecosystems, and man and (2) Federal, State, regional, and local regulations, and affected Native American tribal requirements applicable to transmission system design, construction, or operation have been considered.

The following information should be included in the EIS:

- the owner and operator of transmission lines that will connect the proposed plant to the grid.
- the characteristics of the interconnecting lines including the voltage, minimum conductor to ground clearance, and maximum induced current to ground for vehicles or obstacles under the lines.
- the process followed, or to be followed, in selecting the interconnection route.
- the route of the proposed power transmission system.
- rights-of-way lengths, widths, and areas. Tower locations for sensitive (e.g., historic) areas should be included.
- the location of other facilities, such as substations.
- a statement related to compliance with applicable standards and regulations.

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

18 CFR Part 35. Code of Federal Regulations, Title 18, *Conservation of Power and Water Resources*, Part 35, "Filing of Rate Schedules and Tariffs."

Institute of Electrical and Electronic Engineers, Inc. (IEEE). (current edition). National Electrical Safety Code (NESC), New York.

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.
