

Attachment 5: Staff Guidance for Need for Power Reviews in New Reactor Environmental Impact Statements COL/ESP-ISG-026

Background

Chapter 8 of an Environmental Impact Statement (EIS) will include the staff's need for power assessment for a Combined License Application, or an Early Site Permit (ESP) Application, if a need for power discussion has been incorporated into the ESP application. The staff should employ the outline below, revising it to account for project specific needs.

Rationale

The rationale of this guidance is to clarify certain aspects of NUREG-1555, the Environmental Standard Review Plan (ESRP) for new reactors. This guidance clarifies NUREG-1555, Sections 8.0 through 8.4 ([NRC 2000](#)). The ESRP Sections 8.1 through 8.4 were revised in NUREG-1555, Draft Revision 1 in July 2007 ([NRC 2007](#)). This guidance is entirely consistent with the existing ESRP. It provides clarifications on sections that had been subject to misinterpretation and expands upon sections where standard practices have evolved over time. As with the guidance in the ESRP, none of the clarifications in this guidance impose new requirements.

Staff Guidance

ESRP Section 8.0, Need For Power

Summary of Changes:

The following changes in the AREAS OF REVIEW and Review Interfaces sections should completely replace the information currently in ESRP Section 8.0. The information presented in this chapter was not updated in the July 2007 ESRP revision.

I. AREAS OF REVIEW:

This guidance directs the staff's preparation of an introductory section for the portion of the EIS that evaluates the need for power. The U.S. Nuclear Regulatory Commission (NRC) staff's role in the need for power analysis is indicated in a denial of petition for rulemaking ([NRC 2003](#)).

The introduction will include the Purpose and Need generally in terms of: (1) the ~~type of power (baseload or not)~~, (2) the amount of power (MWe), (32) location of the service area, (43) expected startup date(s), and (54) the regulatory system and associated requirements in the service area. The scope of the paragraph covered by this section introduces the areas to be addressed in the reviews conducted under ESRP Sections 8.1 through 8.4.

Review Interfaces:

- ESRP Section 1.1 –This section describes the project, the amount of power needed ~~and~~ to be produced, the service area, and the timing of the project for the staff to perform a need for power analysis.
- ESRP Section 9.2 - Information from this section will be used in the energy alternatives assessment.
- ESRP Section 9.3 – The service area for the proposed site, as defined in the Purpose and Need statement, defines the relevant area where an alternative site can be considered.

ESRP Section 8.1, Description of Power System

Summary of Changes:

The following changes clarify the information currently in the AREAS OF REVIEW section of ESRP Section 8.1. The AREAS OF REVIEW section was updated in the July 2007 ESRP revision to inform the reviewer about the current state of energy markets in the country. The information in Review Interfaces should be added to the information in ESRP Section 8.1. The guidance below informs the reviewer about the current process for ESRP Section 8.1.

I. AREAS OF REVIEW:

ESRP Chapter 8.1 introduces the four criteria that form the basis upon which the staff determines whether the need for power analysis provided by the applicant or an independent third party (e.g., a state public service commission) ~~maybe~~, **Independent System Operator, or Regional Transmission Organization** ~~may be~~ relied on by the NRC, or whether the staff must conduct an independent analysis. The applicant's need for power analysis must be (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. It can be performed directly by the applicant or by an independent third party. If the need for power analysis does not meet the four criteria, the staff should perform its own analysis in accordance with the criteria delineated in the ESRP ~~sections~~ **Sections** 8.2.1, 8.3, and 8.4.

If the applicant's analysis of need meets the four criteria provided above, the staff may rely on that analysis for the need for power discussion in the EIS. If the applicant's need for power analysis does not meet the four criteria, the staff must either find a suitable third party analysis that satisfies the four criteria or perform its own assessment of the need for power in the applicant's defined service area. **This chapter does not consider the benefits associated with the project. As enumerated by the applicant in its ER, the staff would review benefits as a part of its analysis in Section 10.6 of the EIS.** This review provides input to the reviews conducted under ESRP Sections 8.2.1, 8.3, and 8.4.

The ESRP and its 2007 revision identify the four criteria for the acceptability of an analysis provided by an applicant or an independent third party without explicitly defining them. In this Interim Staff Guidance, the staff defines the four criteria for clarification:

- *Systematic* is defined as an analysis that has been performed according to an objective, thorough, methodical, deliberate, and organized manner. The analysis has been presented in a step-wise manner to a logical conclusion that is supported by the data and reasoning provided.
- *Comprehensive* is defined as an analysis that is detailed, broad in scope, and includes a sufficient number of factors that are relevant, so that the reviewer can reasonably conclude that the analysis could be considered "complete." The depth of analysis and discussion for each factor is commensurate with its relative importance.

- *Subject to confirmation* is defined as an analysis that is independently reviewed or confirmed by another entity [e.g. state or federal reviews of Integrated Resource Plans (IRPs) or Federal Energy Regulatory Commission (FERC) reviews of Independent System Operator (ISO) or Regional Transmission Organization (RTO) reports].
- *Responsive to forecasting uncertainty* is defined as a stable and robust methodology. It is not unduly affected by the presence of outliers or other small departures from the model's assumptions, yet remains capable of characterizing the relative importance of uncertainty among input variables during sensitivity analyses.

~~The need for power can be demonstrated by the staff in the EIS and the applicant in its ER by one or more of the following:~~

- ~~1. Demonstrating the entire capacity of the proposed new generating units can be utilized within the applicant's relevant service area. If that is not possible within the time frame of the analysis, then the applicant may also account for the full capacity of the proposed units by including:~~

~~The sale of surplus capacity "on the grid"~~

The current ESRP methodology for determining need for power is still valid. In addition to the methodologies outlined in the ESRP, the reviewer may use the following processes to assess need for power (i.e., that the full capacity of the proposed project three years after the commencement of full operations will be fully utilized in the electricity market):

1. Certification of Need: Demonstrating that the proposed action has obtained formal certification from a utility authority stating the public need for the proposed project is the most direct method for determining the need for power. When such a certification has been achieved, NRC recognizes the primacy of the States in determining the need for power where such regulations are in place and further analysis is not necessary. The reviewer should cite the certification in the conclusions section as the basis for a positive determination of need.
2. Account for the Capacity: Accounting for the full capacity of the proposed project within the relevant market area three years after the commencement of full operations of the project is the most commonly used approach to demonstrating need. For the relevant market area, the comparison of future total peak demand for electricity (including reserve requirements) against future total capacity should include;
 - a. All planned capacity additions
 - b. All planned closures (including for environmental reasons)
 - c. All imports and exports of electricity.

If the reviewer determines the proposed project carries a surplus (unaccounted for) capacity, the applicant may account for the remaining capacity of the proposed units by demonstrating the remaining capacity of the proposed can be sold to areas outside the applicant's relevant service area ~~and/or~~.

- ~~1. The replacing of older, more polluting or otherwise undesirable generating capacity within~~

~~the applicant's relevant service area.~~

~~For the staff to rely upon the applicant's need for power assessment, the ER must include a demonstration of the applicant's stated need. The following are acceptable methods by which the applicant may demonstrate need:~~

- ~~a) Need within the applicant's service area can be demonstrated by the applicant in a manner consistent with the four reliability criteria discussed above,~~
- ~~a) Need for power outside the applicant's service area should be demonstrated by the application containing a needs assessment for areas proposed to be served outside the relevant service area consistent with the four reliability criteria, and~~
- ~~a) Need for replacement power can be demonstrated by the applicant stating in its application its intent to close down other facilities it owns within the relevant service area, in conjunction with a needs determination consistent with the four criteria for the relevant area.~~

However, if

- 4.3. Market-based Assessment: For a regulated utility, demonstrating the need for baseload power is a simple accounting exercise similar to the above strategy because the utility has a fully defined inventory of generating units in a monopoly service area. For a merchant plant, demonstrating the need for baseload is an economic distribution process by which the reviewer demonstrates the proposed project has the economic feasibility to successfully compete in the RTO or ISO hourly market at a frequency consistent with the capacity factor definition of a baseload generating unit.

In all cases, the reviewer is free to employ a need for power assessment that is not explicitly identified by the ESRP or the above list, provided such deviation is accompanied by a detailed explanation as to (1) why the reviewer employed a different approach and (2) a detailed explanation as to why the reviewer's preferred methodology meets the NRC's standards for quality and transparency.

If an acceptable third party analysis does not exist or the staff cannot locate ~~an acceptable reliable~~ third party analysis (or a suitable analysis performed by the applicant) ~~that meets the four criteria, is not provided~~, the NRC staff will ~~deperform~~ its own analysis using the process presented in the Data and Information Needs section of ESRP Section 8.1, Draft Revision 1. The remainder of this attachment assumes an independent third party analysis (or a suitable analysis performed by the applicant) exists upon which the staff may rely in its need for power assessment.

Review Interfaces:

- ESRP Section 8.0 – Incorporate information from the introductory paragraphs with respect to the purpose and need for the project.
- ESRP Section 9.2 – Information from this section will be used in the energy alternatives assessment.

- ESRP Section 9.3 - For establishing the service area for alternative site selection purposes.

ESRP Section 8.2, Power Demand

Summary of Changes:

The following changes in the AREAS OF REVIEW and Review Interfaces sections ~~should replace~~ ~~are supplemental to the information discussion~~ currently in ESRP Section 8.2. The information presented in this chapter was not updated in the July 2007 ESRP revision.

ESRP Sections 8.2.1 and 8.2.2 can be combined effectively under ESRP Section 8.2 without any loss of meaning; therefore, this guidance combines the Subsections 8.2.1 and 8.2.2 under a new Section 8.2 which will be incorporated in the next revision of the ESRP.

I. AREAS OF REVIEW:

This guidance relates to the staff's description in the EIS of the process, requirements, or statutes that guide the staff's assessment of the relevant service area's demand for electricity, based on an acceptable analysis by the applicant or an independent third party. This section should also summarize, if available, the regulatory or statutory requirements guiding the independent third party's analysis, if any (e.g. state requirements for IRPs, federal requirements for reliability from Congress or FERC, or applicable ISO and RTO requirements). This section analyzes reasonably foreseeable power and energy demand requirements at the commencement of operations activities and factors affecting change in demand.

Information in this section should include the following factors of demand ~~between the year of application through three years after the commencement of full operation of the project~~, if applicable: residential, commercial, industrial, instructional, and other electricity demand, reliability reserve requirements, demand side management (DSM) or energy efficiency (EE) characteristics, new legislative or regulatory requirements affecting the demand for electricity, and any other unique characteristics found by the reviewer.

The reviewer should include a table that presents the important characteristics of total system demand for power in the relevant ~~servicemarket~~ area, including the reserve margin, up to three years following commercial operation of the full project. The table should be similar to 8.2-X, adjusted based on site-specific factors.

If no independent third party analysis can be found that meets the NRC's four criteria, the staff shall create, with appropriate information requested from the applicant as necessary through the Request for Additional Information process and its own electricity demand analysis according to the process presented in ESRP Section 8.2.1, Draft Revision 1.

Review Interfaces:

- ESRP Section 8.1 – If the applicant's or independent third party's analysis meets the four criteria, use demand information from that analysis in this section. If no acceptable independent third party analysis can be found, the staff should perform its own analysis based upon available information about the power demand of the service area.

Table 8.2-X. Demand Forecast Summary (MW(e))

	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20YY ¹
Residential										
Commercial										
Industrial										
Other										
LESS: DSM or EE										
Total Demand										
Reserve Margin										
Total System Demand										

1 20YY indicates three years following the commencement of full operation of the proposed project.

ESRP Section 8.3, Power Supply

Summary of Changes:

The following changes in the AREAS OF REVIEW and Review Interfaces section clarify the information currently in ESRP Section 8.3. No substantive changes have been made to ESRP Section 8.3. This section of the ESRP was updated in July 2007.

I. AREAS FOR REVIEW:

The discussion in this section should include information pertaining to the applicant's proposal to meet its identified purpose and need. The discussion in this section should include information related to present and future characteristics of the applicant's power supply portfolio. Information in this section should include, if applicable, **the following factors of power supply between the year of application through three years after the commencement of full operation of the project, expected closures and additions of capacity, net electricity imports, and** supply-side legislative or regulatory requirements or any other unique characteristics found by the reviewer.

The reviewer should include a table that presents the important characteristics of total system supply in the relevant service area up to three years following commercial operation of the full project, **including baseline capacity, projected additions and closures, and net imported power.** The table should be similar to 8.3-X, but adjusted based on site-specific factors.

If no independent third party analysis can be found that meets the NRC's four acceptance criteria, the staff shall create, with appropriate information requested from the applicant as necessary through the Request for Additional Information process and its own electricity supply analysis according to the process presented in ESRP Section 8.3, Draft Revision 1.

Review Interfaces:

- ESRP Section 8.1 – If the applicant's or independent third party's analysis meets the four criteria, use supply information from that analysis in this section. If no acceptable independent third party analysis can be found, the staff should perform its own analysis based upon available information about the power supply of the service area.

Table 8.3-X. Supply Resources Summary (MW(e))

	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20YY ¹
Baseload Resources										
Intermittent or Peak Resources										
LESS: Retirements										
PLUS: Additions										
Total Installed Capacity										
Exported Power										
Imported Power										
Net Transactions										
Total Supply										

1 20YY indicates three years following the commencement of full operation of the proposed project.

ESRP Section 8.4, Assessment of Need For Power

Summary of Changes:

ESRP Section 8.4, Draft Revision 1 provides significant guidance on how the staff should perform a need for power analysis. However, no new subject matter should be presented in Section 8.4. This section of the EIS should have a comparison of the applicant's or independent third party's projected future demand and supply, yielding the net MW(e) needed, compared to the capacity of the proposed project, and a conclusion about whether or not there is a need for the power. If the staff performs the need for power analysis, it should summarize the information using the guidance as applicable.

The reviewer should include a table that presents the expected total system demand and supply from Sections 8.2 and 8.3. The table should be similar to 8.4-X, but adjusted based on site-specific factors.

Table 8.4-X. Demand and Supply Forecast Summary (MW(e))

	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20XX	20YY ¹
DEMAND										
System Demand										
Reserve Margin										
Total Demand										
SUPPLY										
Capacity										
Net Transactions										
Net Capacity										
LESS: Retirements										
PLUS: Additions										
Total Supply										
Surplus (Deficit) Without the Proposed Project										
Project Capacity										
Surplus (Deficit) With the Proposed Project										

1

20YY indicates three years following the commencement of full operation of the proposed project.

References:

[Nuclear Regulatory Commission \(NRC\). 2000:](#) *Environmental Standard Review Plan – Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555. Washington, D.C.

Nuclear Regulatory Commission (NRC). 2003: 68 FR 55905. September 29, 2003. “Nuclear Energy Institute; Denial of Petition for Rulemaking.” *Federal Register*. U.S. Nuclear Regulatory Commission.

Nuclear Regulatory Commission (NRC). 2007: *Environmental Standard Review Plan – Standard Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG-1555, Revision 1. Washington, D.C.