



U.S. NUCLEAR REGULATORY COMMISSION  
**STANDARD REVIEW PLAN**  
OFFICE OF NUCLEAR REACTOR REGULATION

14.3.1<sup>1</sup> SITE PARAMETERS (Tier 1)

REVIEW RESPONSIBILITIES

Primary - Civil Engineering and Geosciences Branch (ECGB)

Secondary - Emergency Preparedness and Radiation Protection Branch (PERB)

I. AREAS OF REVIEW

ECGB reviews the site parameters in the Design Control Document (DCD) Tier 1, Chapter 2 of the DCD Tier 2, and the supporting information in DCD Tier 2 Section 14.3 submitted by the applicant.

During reviews of early site permit applications under Subpart A to 10 CFR Part 52, or reviews of combined license applications under Subpart C to 10 CFR Part 52, ECGB reviews the information submitted to demonstrate compliance with the site parameters for the standard design, and other site parameters not within the scope of the standard design.

Review Interfaces

SRP Section 14.3 provides general guidance on review interfaces. ECGB performs related reviews and coordination activities, as requested by other branches, for issues in Tier 1 regarding site parameters.

ECGB also performs the following reviews under the SRP sections indicated:

1. ECGB determines the acceptability of Tier 1 information for structural engineering items in SRP Section 14.3.2.

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**USNRC STANDARD REVIEW PLAN**

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. 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. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans 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 Nuclear Reactor Regulation, Washington, D.C. 20555.

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2. ECGB determines the acceptability of Tier 1 information for piping design, including piping DAC if applicable, in SRP Section 14.3.3.

### Secondary Review Branch Responsibilities

1. The PERB determines the acceptability of Tier 1 information regarding atmospheric dispersion (X/Qs) for exclusion area boundaries and low population zones (LPZs) in SRP Section 14.3.8.

## II. ACCEPTANCE CRITERIA

The acceptance criteria for ITAAC are based on meeting 10 CFR 52.97(b)(1), which sets forth the comprehensive requirements for ITAAC. For design certification reviews, the scope of ITAAC is limited to the scope of the certified design as required by 10 CFR 52.47(b). The requirements for site parameters for the standard design are contained in 10 CFR 52.47(a)(1)(iii). The design certification applicant must provide postulated site parameters for the design, and an analysis and evaluation of the design in terms of such parameters. The following should be addressed to demonstrate that the standard design meets the above criteria.

The site parameters used in the design must be specified in both Tier 1 and DCD Tier 2 Chapter 2. The site parameters specified in Tier 1 are the top-level bounding site parameters used in the selection of a suitable site for a facility referencing the certified design. Because they were used in bounding evaluations of the certified design, they define the requirements for the design that must be met by a site. This ensures that a facility built on the site remains in conformance with the design certification. Appropriate values for site parameters should be selected that make the design suitable for many sites. The site parameters specified in the DCD Tier 2 Chapter 2 should be consistent with those in Tier 1.

The analysis and evaluation of the design may be contained in the various sections of the DCD Tier 2. For example, the safe shutdown earthquake parameter is discussed in structural and piping analyses in Chapter 3, atmospheric dispersion parameters are discussed in radiological analyses in Chapter 15, and elevation parameters are discussed in the flooding analyses in Chapter 15. Supporting information for the ITAAC may also utilize these site parameters, as discussed in SRP Sections 14.3.2 and 14.3.3. The staff's evaluations of the site parameters and the design in the appropriate sections of DCD Tier 2 should be utilized to determine the appropriate top-level site parameters for Tier 1, and their acceptability.

Site parameters should be specified for the following parameters:

- Maximum ground water level
- Maximum flood level
- Precipitation (rain and snowfall)
- Ambient Design Temperature
- Extreme Wind
- Tornado (maximum speed, pressure drop, missile spectra)

Soil Properties (minimum bearing capacity, minimum shear wave velocity, liquefaction potential)  
Seismology (SSE response spectra, using figures)  
Meteorological Dispersion (Values at EAB and LPZ at appropriate time intervals for short and long term)

The site parameters should include a requirement that liquefaction not occur underneath structures, systems, and components resulting from the site-specific SSE. In addition, although the design for the sites should be based on the 0.3g Regulatory Guide 1.60 spectra, the evaluation of the sites for liquefaction potential should use the site-specific SSE with acceptance criteria demonstrating adequate margin for no liquefaction.

Site parameters for external missile spectra should be specified in Tier 1. Alternatively, the design basis for missiles may be specified in the DCD Tier 2, provided that external missiles are adequately addressed in the design for buildings and structures, and verified by appropriate ITAAC.

An applicant for a combined license shall include a commitment in the site specific portion of the SAR for a facility to: (1) notify the staff immediately if previously unknown geologic features, such as faults, liquefiable soils, etc, are encountered during excavations at the site; (2) geologically map all excavations for Seismic Category I structures, as a minimum; and (3) notify the staff when the excavations are open for examination and evaluation.

An applicant for a combined license must demonstrate that the site parameters in the design certification rule are met at a given site as part of an application and issuance of a combined license under Subpart C of 10 CFR Part 52. If the site cannot meet these site parameters, an exemption must be requested in accordance with the change process in the rule certifying the design.

Also, consideration of hazards and parameters that were not previously considered as part of the design certification is done as part of a combined license application on a site-specific basis. Examples may include proximity to air traffic patterns, toxic hazards, and transportation.

### III. REVIEW PROCEDURES

1. Follow the general procedures for review of Tier 1 contained in the Review Procedures section of SRP Section 14.3. Ensure that the DCD is consistent with Appendix A to SRP Section 14.3.
2. Review the site parameters in Tier 1 and DCD Tier 2 Chapter 2 to ensure that the appropriate site parameters are specified, and their values are appropriate for many potential sites. Review Tier 1 to ensure that all information is consistent with the DCD Tier 2 information.
3. Review the appropriate analyses for evaluation of the site parameters in the DCD Tier 2 for adequacy, and ensure that the top-level site parameters are specified in Tier 1.

4. Ensure that the inputs from PERB regarding atmospheric dispersion site parameters are appropriately treated in Tier 1 and DCD Tier 2 Chapter 2.

#### IV. EVALUATION FINDINGS

The reviewer verifies that sufficient information has been provided to satisfy the requirements of this SRP section, and concludes that Tier 1 is acceptable. The findings should support the following type of overall conclusive statement to be included in the staff's safety evaluation report:

"(The applicant) provided site parameters postulated for the certified design in Tier 1 and in the appropriate sections of the DCD Tier 2. The appropriate sections of the DCD Tier 2 information also provided an acceptable analysis and evaluation of the design in terms of these parameters, and the staff found the design acceptable in the related sections of this report."

"Further, based on the staff's review of the site parameters in the (standard design) Tier 1, and a review of the selection methodology and criteria for the development of Tier 1 contained in DCD Tier 2 Section 14.3, the staff concludes that (the applicant) provided the top-level site parameters in Tier 1. Therefore, the staff also concludes that the site parameter information in Tier 1 meets the requirements for design certification applications in 10 CFR 52.47(a)(1)(iii), and is acceptable."

For combined license reviews, the findings should support the following type of overall conclusive statement to be included in the staff's safety evaluation report:

"(The applicant) provided sufficient information to demonstrate that the site parameters for the certified standard design in the DCD have been met by the proposed site, and that the analyses of the design in terms of the site parameters remain valid. Therefore, the site is acceptable for the standard design."

#### V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this SRP section.

This SRP section will be used by the staff when performing safety evaluations of design certification and combined license applications submitted by applicants pursuant to 10 CFR 52. Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed six months or more after the date of issuance of this SRP section.

VI. REFERENCES

1. 10 CFR Part 52, §52.47 "Contents of Applications."
2. 10 CFR Part 52, §52.97 "Issuance of Combined Licenses."
3. Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants."
4. NUREG-1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor", Volumes 1 and 2, July 1994.
5. NUREG-1462, "Final Safety Evaluation Report Related to the Certification of the System 80+ Design," Volumes 1 and 2, August 1994.

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**SRP Draft Section 14.3.11**  
Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	<b>Integrated Impact 1534</b>	The scope and content of this proposed SRP section is derived from the requirements of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants," as well as the guidance in staff SECY papers related to design certification and combined license reviews, and the staff positions established in the Final Safety Evaluation Reports (FSERs) for the evolutionary reactor designs. SRP Section 14.3.1 provides guidance specific to the review of site parameter related design information and related inspections, tests, analyses, and acceptance criteria (ITAAC) provided in applications submitted in accordance with the requirements of 10 CFR 52.

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**SRP Draft Section 14.3.11**  
Attachment B - Cross Reference of Integrated Impacts

<b>Integrated Impact No.</b>	<b>Issue</b>	<b>SRP Subsections Affected</b>
1534	Develop Acceptance Criteria and Review Procedures for review of Certified Design Material (CDM) including associated inspections, tests, analyses and acceptance criteria (ITAAC) for site parameters.	All