U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

2. 0 SITE CHARACTERISTICS AND SITE PARAMETERS

REVIEW RESPONSIBILITIES

Primary - Designated Licensing Project Management Branch

Secondary - All Standard Review Plan Chapter 2 review organizations

I. AREAS OF REVIEW

This Standard Review Plan (SRP) section contains general review guidance related to design characteristics, design parameters, site characteristics, and site parameters, as applicable, contained in early site permit (ESP), standard design certification (DC), and combined license (COL) applications submitted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." A particular emphasis in this section is on the relationship between the site parameters of approved DCs and the site characteristics presented in subsequent COL applications. This section is not applicable to construction permit (CP) and operating license (OL) applications submitted in accordance with 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

Revision 1 – October 2016

10 CFR 52.1, “Definitions,” includes the following:

- *Design characteristics* are the actual features of a reactor or reactors and are specified in a DC or COL.

- *Design parameters* are the postulated features of a reactor or reactors that could be built at a proposed site and are specified in an ESP.

- *Site characteristics* are the actual physical, environmental and demographic features of a site and are specified in an ESP or in a Final Safety Analysis Report (FSAR) for a COL.

- *Site parameters* are the postulated physical, environmental and demographic features of an assumed site and are specified in a DC.

In designing its facility, each DC applicant bases its design, in part, on a set of postulated site parameters. A COL applicant that references a DC is required under 10 CFR 52.79(d)(1) to demonstrate that the characteristics of the proposed site fall within the site parameters specified in the DC to ensure that the reactor design can be safely sited there. ESP applicants also compile a set of site characteristics which, if approved, will be listed in the ESP. 10 CFR 52.39(a) grants ESP holders a level of finality for the set of site characteristics contained in an ESP.

In evaluating its site, each ESP applicant bases its evaluation, in part, on a set of postulated reactor design parameters. These design parameters, if approved, will also be listed in the ESP. A COL applicant referencing an ESP is then obligated under 10 CFR 52.79(b)(1) to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP. If the COL applicant references a DC as well as an ESP, the design of the facility is governed by the DC’s site parameters and design characteristics. Therefore, the COL applicant must demonstrate that the site parameters specified in the DC bound the corresponding ESP and COL site characteristics, and that the design characteristics in the DC are bounded by the ESP design parameters. Note that the COL applicant may need to identify additional site characteristics that were not in the ESP to compare against relevant site parameters in the DC (for example, accident release Control Room and Technical Support Center X/Q values).

More detailed information related to the review of specific design characteristics, design parameters, site characteristics, and site parameters is provided in the subsequent SRP Chapter 2 sections.

1. Early Site Permit (ESP) Reviews

   a) For an ESP application, the Chapter 2 review is focused on the identification of actual site characteristics and postulated design parameters necessary for approval of the proposed site. The scope and level of review parallels that performed for a CP application submitted under 10 CFR Part 50. Examples of actual site characteristics and postulated design parameters that should be

addressed in an ESP application are included in Tables 1 and 2 in Appendix A to this SRP section.

2. Standard Design Certification (DC) Reviews

a) For a DC application, the Chapter 2 review is focused on actual design characteristics and postulated site parameters for the design. A subset of the site parameters will become part of the certified design. Previous certified designs have used the designations "Tier 1," for the portion of design-related information that is approved and certified, and "Tier 2," for the portion that is approved but not certified.[1] Site parameters may be included among both Tier 1 and Tier 2 information. Section 2.0 should summarize the complete set of site parameters, including the subset of top-level (Tier 1) site parameters that will be included within the certified design. Because site parameters were used in bounding evaluations of the DC applicant's design, they define the requirements for the design that must be met by the site characteristics of a proposed site. Examples of design characteristics and site parameters that should be addressed in a DC application are included in Tables 1 and 2 of Appendix A to this SRP section.

3. Combined License (COL) Reviews

a) For a COL application, the Chapter 2 review focuses on the actual site and design characteristics that are presented in the application, and on comparing them with the site parameters postulated in the DC and, if applicable, with the design parameters postulated in an ESP. These characteristics and parameters are reviewed to the level of detail needed to enable the staff to reach a conclusion on all safety matters related to siting. The review scope of SRP Section 2.0 depends on whether a COL application references an ESP, a DC, both, or neither.

b) For a COL application that references an ESP but not a DC, the ESP contains site characteristics that describe the key actual features of the site, and design parameters that bound the postulated features of a facility that could be built at the site. The review of SRP Section 2.0 focuses on the applicant's demonstration that the design of the facility presented in the COL application falls within (i.e., is bounded by) (1) the actual site characteristics specified in the ESP and COL, and (2) within the design parameters postulated in the ESP.

c) For a COL application that references a DC but not an ESP, the DC contains design characteristics that describe the key actual features of the facility design, and site parameters that bound the postulated features of a site where such a facility could be built. The review of SRP Section 2.0 focuses on the applicant's

[1]Classification of site parameters as Tier 1 and Tier 2 has become customary, but is not defined by regulation and is not required. Tier 1 and Tier 2 are defined only by way of publication of individual DC rules. For examples, see Appendices A through E to 10 CFR Part 52.

demonstration that the actual characteristics of the site presented in the COL application fall within (i.e., are bounded by) the corresponding site parameters postulated in the DC.

d) For a COL application referencing both a DC and an ESP, the review of SRP Section 2.0 focuses on the applicant's demonstration that (1) the actual design characteristics of the facility presented in the DC fall within (i.e., are bounded by) the design parameters postulated in the ESP, and (2) the actual site characteristics presented in the ESP and COL fall within (i.e., are bounded by) the corresponding site parameters postulated in the DC.

e) For a COL application that references neither an ESP nor a DC, the review of SRP Section 2.0 focuses only on summary information related to the set of actual site and design characteristics needed to enable the staff to reach a conclusion on all safety matters related to siting. The review of the site and design characteristics is contained in the related SRP Chapter 2 or other referenced SRP sections.

Review Interfaces

The bases for the chosen design characteristics, design parameters, site characteristics, and site parameters are reviewed in the subsequent sections of SRP Chapter 2 and in other referenced SRP sections.

II. ACCEPTANCE CRITERIA

Requirements

Acceptance criteria are based on meeting the relevant requirements of the following U.S. Nuclear Regulatory Commission (NRC) regulations:

1. 10 CFR 52.17(a)(1)(vi) requires an ESP applicant to describe the seismic, meteorological, hydrologic, and geologic characteristics of the proposed site.

2. 10 CFR 52.47(a)(1) requires a DC applicant to provide site parameters postulated for the design.

3. 10 CFR 52.79(a)(1)(i) through 10 CFR 52.79(a)(1)(vi) provides the site-related contents of a COL application.

4. 10 CFR 52.79(b)(1) and 10 CFR 52.79(b)(2) requires a COL application referencing an ESP to provide information sufficient to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP. If the application does not demonstrate that the design of the facility falls within (i.e., is bounded by) the site characteristics and design parameters, the application shall include a request for a variance that complies with the applicable regulations.

5. 10 CFR 52.79(d)(1) requires a COL application referencing a DC to provide information sufficient to demonstrate that the characteristics of the site fall within the site parameters specified in the DC.

6. 10 CFR Part 100, “Reactor Site Criteria,” provides siting factors and criteria for determining an acceptable site.

SRP Acceptance Criteria

Specific SRP acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations identified above are as follows for the review described in this SRP section. The SRP is not a substitute for the NRC's regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria, and to evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

1. For ESP, DC, and COL applications, the acceptance criteria associated with design characteristics, design parameters, site characteristics, and site parameters are contained in the subsequent sections of SRP Chapter 2 and other referenced SRP sections.

2. For a COL application referencing an ESP but not a DC, acceptance is based on the applicant’s demonstration that the design of the facility presented in the COL application falls within (i.e., is bounded by) the actual site characteristics and postulated design parameters specified in the ESP. If the COL FSAR does not demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP, the application shall include a request for a variance from the ESP that complies with the requirements of 10 CFR 52.39, “Finality of Early Site Permit Determinations,” and 10 CFR 52.93, “Exemptions and Variances.”

3. For a COL application referencing a DC but not an ESP, acceptance is based on the applicant’s demonstration that the actual characteristics of the site presented in the COL fall within (i.e., is bounded by) the corresponding site parameters postulated in the DC. If the actual site characteristics do not fall within the site parameters postulated in the DC, the COL applicant must provide sufficient justification (e.g., by requesting an exemption from or amendment to the DC) that the proposed facility is acceptable at the proposed site.

4. For a COL application referencing both an ESP and a DC, acceptance is based on the applicant’s demonstration that (a) the actual design characteristics of the facility presented in the DC fall within (i.e., is bounded by) the design parameters postulated in the ESP, and (b) the actual site characteristics presented in the ESP and COL fall within (i.e., is bounded by) the corresponding site parameters postulated in the DC. If the actual site characteristics presented in the ESP and COL do not fall within (i.e., are not bounded by) the postulated site parameters in the DC, or the actual design characteristics specified in the DC do not fall within the postulated design parameters specified in the ESP, the COL applicant must provide sufficient justification (e.g., by

requesting an exemption from or amendment to the DC, or requesting a variance from the ESP) that the proposed facility is acceptable at the proposed site.

5. For a COL application referencing neither an ESP nor a DC, acceptance is based on the applicant's identification of the complete set of actual site and design characteristics needed to enable the staff to reach a conclusion on all safety matters related to siting.

III. REVIEW PROCEDURES

The reviewer will select material from the procedures described below, as may be appropriate for a particular case.

These review procedures are based on the identified SRP acceptance criteria. For deviations from these acceptance criteria, the staff should review the applicant's evaluation of how the proposed alternatives provide an acceptable method of complying with the relevant NRC requirements identified in Subsection II.

Detailed review procedures are provided within the various sections of SRP Chapter 2.

1. Early Site Permit (ESP) Reviews

The licensing project manager should coordinate with the technical reviewers to ensure that the appropriate actual site characteristics and postulated design parameters are included within the ESP. The licensing project manager should summarize this information in tabular form in an appendix to the safety evaluation report (SER). Examples of site characteristics and design parameters that should be addressed are included in Tables 1 and 2 of Appendix A to this SRP section. Note that these tables are not necessarily complete lists (e.g., additional site characteristics particular to a given area or region may exist that should also be covered under Chapter 2 reviews).

2. Standard Design Certification (DC) Reviews

The licensing project manager should coordinate with the technical reviewers to ensure that the appropriate postulated site parameters and actual design characteristics are included within the DC. Examples of site parameters and design characteristics that should be addressed are included in Tables 1 and 2 in Appendix A to this SRP section. Note that these tables are not necessarily complete lists of all the necessary site parameters and design characteristics to be included in the DC review. Additional site parameters and design characteristics particular to a given reactor design may exist that should also be covered under the Chapter 2 reviews.

The licensing project manager should also coordinate with the technical reviewers to ensure that the technical bases for and assumptions made in developing the postulated site parameters are identified and explained in the DC in order to assist ESP and COL applicants in developing compatible site characteristics for their applications.

3. Combined License (COL) Reviews

For a COL application referencing an ESP but not a DC, the licensing project manager should coordinate with the technical reviewers to ensure that the application provides sufficient information to demonstrate that the design of the facility falls within (i.e., is bounded by) the actual site characteristics and postulated design parameters specified in the ESP. Should the design of the facility not fall within (i.e., are not bounded by) the actual site characteristics and postulated design parameters specified in the ESP, the technical staff evaluates supporting justification (e.g., an applicant-requested variance) that the proposed facility is acceptable at the proposed site.

For a COL application referencing a DC but not an ESP, the licensing project manager should coordinate with the technical reviewers to ensure that sufficient information is presented to demonstrate that the actual characteristics of the site presented in the COL application fall within (i.e., is bounded by) the corresponding site parameters postulated in the DC. Should the actual site characteristics not fall within (i.e., are not bounded by) the site parameters postulated in the DC, the technical staff evaluates supporting justification (e.g., an applicant-requested exemption or amendment) that the proposed facility is acceptable at the proposed site.

For a COL application referencing both a DC and an ESP, the licensing project manager should coordinate with the technical reviewers to ensure sufficient information is presented to demonstrate that (a) the actual design characteristics of the facility presented in the DC fall within (i.e., is bounded by) the design parameters postulated in the ESP, and (b) the actual site characteristics presented in the ESP and COL fall within (i.e., is bounded by) the corresponding site parameters postulated in the DC. If the actual site characteristics presented in the ESP and COL do not fall within (i.e., are not bounded by) the postulated design parameters specified in the DC, the COL applicant must provide sufficient justification (e.g., by requesting an exemption from or an amendment to the DC, or requesting a variance from the ESP) that the proposed facility is acceptable at the proposed site.

For a COL application referencing either an ESP or DC or both, the staff should also review the corresponding sections of the ESP and DC Final SERs to ensure that any early site permit conditions, restrictions to the DC, or COL action items identified in the Final SERs are appropriately addressed. The staff should also ensure that the COL application includes the necessary information for the staff to confirm that the ESP conditions and COL action items have been met.

In addition, long-term environmental changes and changes to the region resulting from human or natural causes may have introduced changes to the site characteristics that could be relevant to the design basis. In the absence of certain circumstances, such as a compliance or adequate protection issue, 10 CFR 52.39 precludes the staff from imposing new site characteristics, design parameters, or terms and conditions not present in the ESP. Consequently, a COL application referencing an ESP need not include a re-investigation of the site characteristics that have previously been accepted in the ESP. However, in accordance with 10 CFR 52.6, “Completeness and Accuracy of

Information," the applicant or licensee is responsible for identifying changes of which it is aware that would satisfy the criteria specified in 10 CFR 52.39. Information on changes provided by the applicant in accordance with 10 CFR 52.6(b) will be addressed by the staff during the review of a COL application referencing an ESP or DC.

For a COL application referencing neither an ESP nor a DC, the licensing project manager should coordinate with the technical reviewers to ensure that the applicant has identified the complete set of actual site and design characteristics needed to enable the staff to reach a conclusion on all safety matters related to siting.

If this is a product other than a Final SER, such as an SER with open items, the staff should include information specific to the identification and closure of the open item(s) and not the paragraphs shown below.

IV. EVALUATION FINDINGS

The evaluation findings regarding the adequacy and appropriateness of design characteristics, design parameters, site characteristics, and site parameters are reviewed throughout SRP Chapter 2 and other referenced SRP sections. The SRP Section 2.0 evaluation findings are specific to the application types as identified below.

The licensing project manager with the appropriate technical reviewers verifies that the applicant has provided sufficient information, and that the review of revised or new information (as required by ESP permit conditions or COL action items) and calculations (if applicable) support conclusions of the following type to be included in the staff's SER. The reviewer also states the bases for those conclusions.

1. Early Site Permit (ESP) Reviews

The following statements should be preceded by a summary of the actual site characteristics and postulated design parameters to be included in any ESP that might be issued for the ESP site:

> As set forth above, the applicant has presented and substantiated information to establish actual site characteristics for the proposed site and postulated design parameters for a reactor or reactors that could be built at the proposed site and has identified specific ESP conditions to be addressed at the COL stage. The staff has reviewed the information provided and, for the reasons given in subsequent sections under Chapter 2 and other related chapters of this SER, concludes that the applicant has established site characteristics and design parameters acceptable to meet the requirements of 10 CFR 52.17(a)(1)(vi) and 10 CFR Part 100.

2. Standard Design Certification (DC) Reviews

The following statements should be preceded by a summary of the actual design characteristics, COL action items, and postulated site parameters used for the plant:

The applicant has selected the actual design characteristics and postulated site parameters referenced above for plant design inputs (a subset of which is included as Tier 1 information), and the staff agrees that the postulated site parameters are representative of a reasonable number of sites that have been or may be considered for a COL application. Accordingly, the staff concludes that the site parameters meet the requirements of 10 CFR 52.47(a)(1).

3. Combined License (COL) Reviews

The following statements should be preceded by identification of the selected actual site characteristics, postulated design parameters, actual design characteristics, and postulated site parameters, as applicable:

a. For a COL application that references an ESP: As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the design of the facility falls within (i.e., is bounded by) the actual site characteristics and postulated design parameters specified in the ESP and any additional site characteristics developed in support of the COL application that were not in the ESP, including permit conditions and COL action items. Accordingly, the staff concludes that subject to any license conditions, the applicant has demonstrated that the design of the facility falls within (i.e., is bounded by) the ESP and COL site characteristics and ESP design parameters and thus meet the requirements of 10 CFR 52.79(b)(1).

   For instances where the design of the facility do not fall within (i.e., is not bounded by) one or more actual site characteristics or postulated design parameters in the ESP, use the following conclusion:

   > As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the design of the facility falls within (i.e., bounds) the actual site characteristics and postulated design parameters specified in the ESP and any additional site characteristics developed in support of the COL application that were not in the ESP. The following exceptions were noted. [The specific site characteristics or design parameters not meeting the above condition(s) are identified as variances to the ESP as substantiated by the supporting technical basis for these variances. These variances and supporting bases are identified in (technical staff to provide information on relevant chapters and sections).] Accordingly, the staff concludes that the applicant has demonstrated, with the identified exception(s), that the design of the facility falls within (i.e., is bounded by) the ESP and COL site characteristics and ESP design parameters and thus meets the requirements of 10 CFR 52.79(b)(1) and10 CFR 52.79(b)(2).

b. For a COL application that references a DC: As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the actual characteristics of the site fall within (i.e., is bounded by) the corresponding postulated site parameters specified in the DC.

Accordingly, the staff concludes that subject to any departures the applicant has demonstrated that the site characteristics fall within the DC site parameters and thus meet the requirements of 10 CFR 52.79(d)(1).

For instances where one or more actual site characteristics do not fall within (i.e., are not bounded by) one or more of the corresponding postulated site parameter(s) specified in the DC, use the following conclusion:

> As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the actual characteristics of the site fall within (i.e., is bounded by) the postulated site parameters specified in the DC. The following exceptions were noted. [The specific site parameters not meeting the above conditions are identified in (technical staff to provide information on relevant chapters and sections) with reference to the technical basis that supports an applicant-requested exception or amendment to the DC.] Accordingly, the staff concludes that the applicant has demonstrated, with the identified exception(s), that the characteristics of the site fall within (i.e., are bounded by) the DC specified site parameters and thus meet the requirements of 10 CFR 52.79(d)(1).

c. For a COL application that references both a DC and an ESP: As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the actual site characteristics and postulated design parameters specified in the ESP and any additional site characteristic values developed in support of the COL application that were not in the ESP fall within (i.e., are bounded by) the corresponding postulated site parameters and actual design characteristics specified in the DC. Accordingly, the staff concludes that the applicant has demonstrated that the ESP and COL site characteristics and ESP design parameters fall within (i.e., are bounded by) the corresponding DC site parameters and design characteristics and thus meets the requirements of 10 CFR 52.79(b)(1) and 10 CFR 52.79(d)(1).

For instances in which one or more actual site characteristics or postulated design parameters do not fall within (i.e., are not bounded by) the corresponding postulated site parameters or actual design characteristics, use the following conclusion:

> As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the actual site characteristics and postulated design parameters specified in the ESP and any additional site characteristic values developed in support of the COL application that were not in the ESP fall within (i.e., are bounded by) the corresponding postulated site parameters and actual design characteristics specified in the DC. The following exceptions were noted. [The specific actual site characteristics and related postulated design parameters and/or the actual design characteristics and related design parameters not meeting the above condition are identified in (technical

staff to provide information on relevant chapters and sections) with reference to the technical basis that supports an applicant-requested variance to the ESP or an exemption from or amendment to the DC.] Accordingly, the staff concludes that the applicant has demonstrated, with the identified exception(s), that the ESP and COL site characteristics and ESP design parameters fall within (i.e., are bounded by) the corresponding DC site parameters and design characteristics and thus meets the requirements of 10 CFR 52.79(b)(1), 10 CFR 52.79(b)(2) and 10 CFR 52.79(d)(1).

d. For a COL application that references neither a DC nor an ESP: As set forth above, the NRC staff reviewed the application to ensure that sufficient information was presented to demonstrate that the applicant has identified the complete set of actual site and design characteristics needed to enable the staff to reach a conclusion on all safety matters related to siting.

V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of ESP, DC, and COL applications submitted by applicants under 10 CFR Part 52. Except when the applicant proposes an acceptable alternative method for complying with specified portions of the NRC's regulations, the staff will use the method described herein to evaluate conformance with NRC regulations.

VI. REFERENCES

1. *U.S. Code of Federal Regulations,* "Definitions," § 52.1, Chapter 1, Title 10, "Energy."

2. *U.S. Code of Federal Regulations,* § 52.6(b), Chapter 1, Title 10, "Energy."

3. *U.S. Code of Federal Regulations,* § 52.17(a)(1)(vi), Chapter 1, Title 10, "Energy."

4. *U.S. Code of Federal Regulations,* § 52.39(a), Chapter 1, Title 10, "Energy."

5. *U.S. Code of Federal Regulations,* § 52.47(a)(1), Chapter 1, Title 10, "Energy."

6. *U.S. Code of Federal Regulations,* § 52.79(a)(1)(i) through § 52.79(a)(1)(vi), Chapter 1, Title 10, "Energy."

7. *U.S. Code of Federal Regulations, §* 52.79(b)(1) and § 52.79(b)(2), Chapter 1, Title 10, "Energy."

8. *U.S. Code of Federal Regulations,* §52.79(d)(1), Chapter 1, Title 10, "Energy."

9. *U.S. Code of Federal Regulations,* "Exemptions and Variances," § 50.93, Chapter 1, Title 10, "Energy."

Paperwork Reduction Act Statement

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Parts 50, 52 and 100, and were approved by the Office of Management and Budget, approval numbers 3150-0011, 3150-0151 and 3150-0093.

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.

APPENDIX A

TABLE 1: EXAMPLES OF SITE CHARACTERISTICS AND SITE PARAMETERS

Site Characteristic/Site Parameter	SRP Section	Site Characteristic		DC Site Parameter
		ESP[1]	COL	
Exclusion Area Boundary (EAB)[2]	2.1.2	Y	Y	-
Outer Boundary of Low Population Zone (LPZ)[2]	2.1.3	Y	Y	-
Population Center Distance	2.1.3	Y	Y	-
External Hazards on Plant Systems, Structures, and Components (SSCs) (e.g.: explosions, fires, release of toxic chemicals and flammable clouds, pressure effects)[3]	2.2.3	Y	Y	Y
Ground-Level Weight of Normal Winter Precipitation Event	2.3.1	Y	Y	Y
Ground-Level Weight of Extreme Frozen Winter Precipitation Event	2.3.1	Y	Y	Y
Depth (inches of water) of Extreme Liquid Winter Precipitation Event[4]	2.3.1	Y	Y	Y
Meteorological Conditions Resulting in Maximum Evaporation and (if applicable) Drift Loss of Water from the Ultimate Heat Sink (UHS)[5]	2.3.1	Y	Y	-
Meteorological Conditions Resulting in Minimum Water Cooling in the UHS[5]	2.3.1	Y	Y	-
100-Year Return Period 3-Second Gust Wind Speed	2.3.1	Y	Y	Y

[1]An ESP application should contain site characteristic values corresponding to all of the site parameter values listed in each of the DCs referenced in the ESP application. All of the referenced DC site parameter values should fall within (i.e., be bounded by) the corresponduing site characteristic values.

[2]Distances to the EAB and LPZ need not be included as site parameters in the DC application. The site-specific EAB and LPZ distances are used to calculate the EAB and LPZ χ/Q site characteristic values in the ESP and COL applications per SRP Section 2.3.4. The site-specific EAB and LPZ χ/Q values are then compared to the corresponding EAB and LPZ χ/Q site parameter values in the DC.

[3]External hazards (except for hurricane and tornado missiles; and if toxic chemicals are onsite and storage is identified for DC) are not typically within the scope of the DC and only onsite sources are evaluated in the DC. However, the DC should demonstrate that the potential external hazards are not design basis accidents.

[4]The depth of the Extreme Liquid Winter Precipitation Event may or may not be a relevant DC site parameter, depending on the geometry of the roofs and the type of drainage provided.

[5]For those plants with emergency active cooling system designs where the UHS is within the scope of the DC, the DC should have COL Information Items directing the COL applicant to complete analyses in accordance with Regulatory Guide 1.27 demonstrating that (a) an adequate 30-day cooling capacity is available during historic meteorological conditions that result in maximum evaporation and (b) the design-basis temperatures of equipment that is important to safety are not exceeded during historic meteorological conditions for minimum heat transfer to the atmosphere.

Site Characteristic/Site Parameter	SRP Section	Site Characteristic		DC Site Parameter
		ESP[1]	COL	
Design-Basis Tornado Parameters Maximum Horizontal Wind Speed Translational Speed Rotational Speed Radius of Maximum Rotational Speed Maximum Pressure Differential Maximum Rate of Pressure Drop	2.3.1	Y	Y	Y
Design-Basis Hurricane Wind Speed	2.3.1	Y	Y	Y
Dry-Bulb Temperature and Mean Coincident Wet-Bulb Temperature[6] 1% Annual Exceedance 0.4% Annual Exceedance 100-Year Return Period Maximum	2.3.1	Y	Y	Y
Dry-Bulb Temperature[6] 99% Annual Exceedance 99.6% Annual Exceedance 100-Year Return Period Minimum	2.3.1	Y	Y	Y
Wet-Bulb Temperature (Non-concurrent)[6] 1% Annual Exceedance 0.4% Annual Exceedance 100-Year Return Period Maximum	2.3.1	Y	Y	Y
Accident Release χ/Q Values at EAB 0-2 hr	2.3.4	Y	Y	Y
Accident Release χ/Q Values at LPZ 0-8 hr 8-24 hr 24-96 hr 96-720 hr	2.3.4	Y	Y	Y

[6]The DC should only list ambient temperature site parameter values that are actually used in the design of the facility and the COL should only list ambient temperature site characteristic values that correspond to ambient temperature site parameter values listed in the referenced DC. The technical bases for and assumptions made in developing the postulated site parameters should also be identified and explained in the DC in order that directly comparable site characteristics can be determined for the related COL and ESP application

Site Characteristic/Site Parameter	SRP Section	Site Characteristic		DC Site Parameter
		ESP[1]	COL	
Accident Release χ/Q Values at Main Control Room (CR) and Technical Support Center (TSC) Air Intakes, Air In-Leakage locations, and Points of Ingress and Egress (as applicable)[7] 0-2 hr 2-8 hr 8-24 hr 24-96 hr 96-720 hr	2.3.4	-	Y	Y
Routine Release χ/Q and D/Q Values at Site Boundary[8] Undepleted/No Decay χ/Q Undepleted/2.26–Day Decay χ/Q Depleted/8.00-Day Decay χ/Q D/Q	2.3.5	Y	Y	-
Routine Release χ/Q and D/Q Values at Locations of Interest[8] Undepleted/No Decay χ/Q Undepleted/2.26–Day Decay χ/Q Depleted/8.00-Day Decay χ/Q D/Q	2.3.5	Y	Y	-
Maximum Flood Elevation Probable Maximum Flood Coincident Wind Wave and Other Effects on Max Flood Level	2.4.1	 Y Y	 Y Y	Y
Maximum Precipitation Rate	2.4.2	Y	Y	Y
Potential for Water Freezing in the UHS Water Storage Facility[9] Potential Frazil and Anchor Ice Maximum Ice Thickness Maximum Cumulative Degree-Days Below Freezing	2.4.7	Y	Y	-
Maximum Elevation of Groundwater	2.4.12	Y	Y	Y

[7]Most ESP applicants have chosen a plant parameter envelope approach, which means no reactor design has been selected. In these situations, it is not possible to calculate χ/Q values for the CR, TSC, and in-leakage locations because the plant configuration is unknown.

[8]The DC does not need routine release χ/Q and D/Q site parameter values to compare against ESP and COL site characteristic values. A COL applicant referencing a DC is expected to utilize its site-specific χ/Q and D/Q site parameter values to perform site-specific gaseous pathway dose analyses following the guidance provided in Regulatory Guides 1.109 and 1.111 and compare the doses to the numerical design objectives of 10 CFR Part 50, Appendix I and demonstrate compliance with the requirements of 10 CFR 20.1302 and 40 CFR Part 190.

[9] The UHS is typically not within the scope of the DC, however, SRP Section 9.2.5 includes guidance for reviewing a UHS in the DC.

Site Characteristic/Site Parameter	SRP Section	Site Characteristic		DC Site Parameter
		ESP[1]	COL	
Travel Time for Groundwater Flow	2.4.12	Y	Y	-
Travel Time for Radionuclide Transport in the Groundwater	2.4.13	Y	Y	-
Inventory of Radionuclides Which Could Potentially Seep into the Groundwater	2.4.13	-	-	Y
Ground Motion Response Spectra (GMRS)[10]/Safe Shutdown Earthquake (SSE)[11]	2.5.2	Y	Y	Y
Fault Displacement Surface Deformation Potential (tectonic and nontectonic) (yes/no)	2.5.3	Y	Y	Y
Minimum Static Bearing Capacity	2.5.4	Y	Y	Y
Minimum Dynamic Bearing Capacity	2.5.4	Y	Y	Y
Lateral Soil Variability	2.5.4	Y	Y	Y
Soil Angle of Internal Friction	2.5.4	Y	Y	Y
Minimum Shear Wave Velocity	2.5.4	Y	Y	Y
Liquefaction Potential (yes/no)	2.5.4	Y	Y	Y
Maximum Settlement	2.5.4	Y	Y	Y
Slope Failure Potential (yes/no)	2.5.5	Y	Y	Y
Tornado Missile Spectra[12][13]	3.5.1.4	-	Y	Y
Hurricane Missile Spectra[12] [13]	3.5.1.4	-	Y	Y
Aircraft Hazards on Plant SSCs[13]	3.5.1.6	Y	Y	Y

[10]GMRS represents the seismic hazard and satisfies 10 CFR 100.23 with respect to the development of the safe shutdown earthquake ground motion (SSE) in FSAR Section 3.7.

[11]The SSE represents the design earthquake ground motion satisfying Appendix S to 10 CFR Part 50 and 10 CFR 100.23 requirements.

[12]Tornado and hurricane missile spectra are not typically within the scope of an ESP.

[13]External hazards (except for hurricane and tornado missiles; and if toxic chemicals are onsite and storage is identified for DC) are not typically within the scope of the DC and only onsite sourcres are evlautaed in the DC. However, the DC should demonstrate that the potential external hazards are not design basis accidents.

TABLE 2: EXAMPLES OF DESIGN CHARACTERISTICS
AND DESIGN PARAMETERS

Design Characteristic / Design Parameter	SRP Section	ESP Design Parameter	DC Design Characteristic
Accident-Related Airborne Effluent Release Point Characteristics for Offsite Receptors Release Locations Release Height(s) Adjacent Building Height(s) Adjacent Building Cross-sectional Area(s)	2.3.4	Y	Y
Routine Airborne Effluent Release Point Characteristics for Offsite Receptors(1) Release Location(s) Release Height(s) Vent/Stack Exit Velocity Vent/Stack Inside Diameter Vent/Stack Exhaust Orientation (vertical, horizontal, or other) Restrictions to Exhaust Air Flow (e.g., rain caps) Adjacent Building Height Adjacent Building Cross-sectional Area	2.3.5 & 11.3 and 11.5	Y	Y
Cooling Water Flow Rate	2.4	Y	Y
Maximum Inlet Temperature to Condenser	2.4	Y	Y
Minimum Site Grade	2.4	Y	Y
Forced Evaporation for the Facility Under Normal Operation	2.4	Y	Y
Design-Basis Accident Source Term	15.0.3	Y	Y

[1] DC design characteristics for routine airborne effluent release points should be provided for those designs where the plant vent stack and building exhaust vents are within the scope of the DC.)

Standard Review Plan Section 2.0
Description of Changes

"Site Characteristics and Site Parameters"

This SRP section affirms the technical accuracy and adequacy of the guidance previously provided in Revision 0, dated March 2007 of this SRP. See Agencywide Documents Access and Management System (ADAMS) Accession No. ML070400364.

The changes incorporated in Revision 1, include incorporation of lessons learned from previous reviews to provide a more detail description of the scope of the review and the information that should be encompassed by an application submitted under 10 CFR Part 52. Descriptions of the changes in each SRP section are as follows:

I. AREAS OF REVIEW

1. Added text to emphasize the scope of this SRP section.

2. Added definition for the following terms: design characteristics, design parameters, site characteristics, and site parameters.

3. Added text to clarify the relations and requirements between the provisions of approved ESPs and DCs and the review of subsequent COL applications.

II. ACCEPTANCE CRITERIA

1. Added text to provide more specific requirements.

2. Added text to clarify the acceptance criteria for the review of a COL application as related to design characteristics, design parameters, site characteristics, and site parameters related to ESP, DC, and COL applications are described.

III. REVIEW PROCEDURES

1. Added pointer to the location of actual site characteristics and postulated design parameters in an ESP SER.

2. Added text to clarify the review procedures of the postulated site parameters in a DC application and the actual site parameters and postulated design parameters for a COL application.

IV. EVALUATION FINDINGS

1. Added clarifying text in the examples of conclusion paragraphs.

III. REFERENCES

1. Expanded the reference for 10 CFR 52.17, “Contents of Applications; Technical Information,” and added 10 CFR 52.79(b)(2).

VI. APPENDICES

1. Based on lessons learned from previous reviews, the Tables 1 and 2 were updated to clarify the site characteristics/parameters or design characteristics/parameters for each type of application.