U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

2. 1. 1 SITE LOCATION AND DESCRIPTION

REVIEW RESPONSIBILITIES

Primary - Organization responsible for the review of siting criteria

Secondary - None

I. AREAS OF REVIEW

The staff reviews information presented by the applicant pertaining to the site boundaries and the location of the site with respect to prominent natural and manmade features that could affect the safe design and siting of the plant. For the evaluation of construction permit (CP), early site permit (ESP), and combined license (COL) applications, the reviewer verifies that the accuracy and level of detail of the site area and reactor location, as provided in the application, are sufficient to assess the acceptability of the reactor site. Additionally, for COL applications that reference a design certification (DC), the reviewer verifies that the site parameters in the DC bound the actual site characteristics provided in the COL application. For the review of DC applications, the reviewer verifies that the applicable parameters in the site parameter envelope are consistent with the acceptance criteria given in Subsection II of this SRP section and are included as Tier 1 information in accordance with SRP Section 14.3.1.

Chapter 2 of the SRP discusses the site characteristics that could affect the safe design and siting of the plant. The staff reviews information presented by the applicant for a CP, DC, ESP, or COL concerning the site location and description. This SRP section applies to reviews performed for each of these types of applications. The review covers the following specific areas:

1. Specification of Location: For CP, ESP, and COL (not referencing an ESP) applications, the staff will review the reactor location with respect to (1) latitude and longitude, and the

Universal Transverse Mercator (UTM)[1] coordinate system; (2) political subdivisions; and (3) prominent natural and manmade features of the area. The purpose of the review is to ascertain the accuracy of the applicant's safety analysis report (SAR) description and for use in independent evaluations of the exclusion area authority and control (SRP Section 2.1.2), the surrounding population (SRP Section 2.1.3), and nearby manmade hazards (SRP Section 2.2.3).

2. Site[2] Area Map: The staff will review the site area, which contains the reactor and associated principal plant structures, to determine the distance from the reactor to the boundary lines of the exclusion area, including the direction and distance from the reactor to the nearest exclusion area boundary line. The evaluation will consider the location, distance, and orientation of plant structures with respect to highways, railroads, and waterways that traverse or lie adjacent to the exclusion area to ensure that they are adequately described to permit analyses (SRP Section 2.2.3) of the possible effects on the plant of accidents on these transportation routes.

3. Additional Information for 10 CFR Part 52 Applications: Additional information will be presented dependent on the type of application. For a COL application, the additional information is dependent on whether the application references an ESP, a DC, both or neither. Information requirements are prescribed within the "Contents of Application" sections of the applicable Subparts to 10 CFR Part 52.

Review Interfaces

The listed SRP sections interface with this section as follows:

1. For DC applications and COL applications referencing a DC rule or DC application, review of 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 is performed under SRP Section 14.3.1, "Site Parameters (Tier 1)."

2. Review of the applicant's authority to control activities in the exclusion area is performed under SRP Section 2.1.2.

3. Review of the population distribution in the exclusion area and the low-population zone is performed under SRP Section 2.1.3.

4. Review of industrial, military, and transportation facilities and transportation routes within or near the exclusion area is performed under SRP Sections 2.2.1-2.2.2 and 2.2.3.

5. Review of public radiation exposure at the exclusion area boundary in the unlikely event of a serious release of radioactive material is performed under SRP Section 13.3 and SRP Chapter 15.

The specific acceptance criteria and review procedures are contained in the referenced SRP sections.

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(1) UTM coordinate system, as found on U.S. Geological Survey (USGS) topographical maps.

(2) "Site" means the contiguous real estate on which nuclear facilities are located and for which one or more licensees has the legal right to control access by individuals and to restrict land use for purposes of limiting the potential doses from radiation or radioactive material during normal operation of the facilities.

II. ACCEPTANCE CRITERIA

Requirements

Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations:

1. 10 CFR Part 50 and 10 CFR Part 52, as they relate to including, in the SAR, a detailed description and safety assessment of the site on which the facility is to be located, with appropriate attention to features affecting facility design (10 CFR 50.34(a)(1), 10 CFR 52.17(a)(1), and 10 CFR 52.79(a)(1)).

2. 10 CFR Part 100, as it relates to the following:

   A. Defining an exclusion area and setting forth requirements regarding activities in that area (10 CFR 100.3).

   B. Addressing and evaluating factors that are used in determining the acceptability of the site as identified in 10 CFR 100.20(b)(1).

   C. Determining an exclusion area such that certain dose limits would not be exceeded in the event of a postulated fission product release as identified in 10 CFR 50.34(a)(1) as it relates to site evaluation factors identified in 10 CFR 100.

   D. Requiring that the site location and the engineered features included as safeguards against the hazardous consequences of an accident, should one occur, should ensure a low risk of public exposure. In particular, 10 CFR 100.20(b)[1], and 10 CFR 100.21 require population density and use characteristics of the site environs, including the exclusion area, low-population zone, and population center distance to be considered in determining the acceptability of a site for a power reactor.

SRP Acceptance Criteria

Specific SRP acceptance criteria acceptable to meet the relevant requirements of the NRC's regulations identified above are as follows for each review described in Subsection I of 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 evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with the NRC regulations.

1. Specification of Location: The information submitted by the applicant is adequate and meets the requirements of 10 CFR 50.34(a)(1), 10 CFR 52.17(a)(1), and 10 CFR 52.79(a)(1) if it describes highways, railroads, and waterways that traverse the exclusion area in sufficient detail to allow the reviewer to determine that the applicant has met the requirements in 10 CFR 100.3.

2. Site Area Map: The information submitted by the applicant is adequate and meets the requirements of 10 CFR 50.34(a)(1), 10 CFR 52.17(a)(1), and 10 CFR 52.79(a)(1) if it describes the site location, including the exclusion area and the location of the plant within the area, in sufficient detail to enable the reviewer to evaluate the applicant's analysis of a postulated fission product release, thereby allowing the reviewer to

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(1) For applications before January 10, 1997 the requirements are identified in 10 CFR 100.10, and 10 CFR 100.11.

determine (in SRP Sections 2.1.2 and 2.1.3 and Chapter 15) that the applicant has met the requirements of 10 CFR 50.34(a)(1) and 10 CFR Part 100.

Technical Rationale

The technical rationale for application of these requirements to the areas of review addressed by this SRP section is discussed in the following paragraphs:

1. Compliance with 10 CFR 100.20 (b)[1] (for applications on or after January 10, 1997) requires that siting and plant design reflect the population density and use characteristics of the plant environs. 10 CFR 100.21 requires that the applicant determine an exclusion area of such size that an individual located at any point on its boundary for 2 hours immediately following onset of a postulated fission product release would not receive a radiation dose exceeding prescribed limits. 10 CFR 100.3 further define the exclusion area.

   The review performed under this SRP section determines whether the application contains information of sufficient accuracy, detail, and completeness to execute a determination of compliance with 10 CFR Part 100. The review further confirms that transportation corridors within the exclusion area do not interfere with normal plant operation. Compliance with the requirements of 10 CFR 50.34 (a)(1) as it relates to site evaluation factors identified in 10 CFR 100 (for CP applications), 10 CFR 52.17(a)(1) (for ESP applications), and 10 CFR 52.79(a)(1) (for COL application) ensures there that the application adequately describes the site on which the facility is to be located and its environs, including applicable site characteristics or site evaluation factors, to evaluate potential exposures from unplanned releases of radioactive fission products. Meeting these requirements provides a level of assurance that an accidental release of fission products will be maintained within acceptable levels and that there is reasonable assurance that appropriate protective measures can be taken in the event of an accident.

3. Compliance with 10 CFR 50.34(a)(1), 10 CFR 52.17(a)(1), and 10 CFR 52.79(a)(1) requires that the SAR include a description and safety analysis of the site on which the facility is to be located. The review performed in this SRP section ensures that the safety analysis contains a description of the site and environs that will enable the staff to evaluate the planned site and provide a level of assurance that plant design and operation will reflect site considerations in an manner adequate to minimize the consequences of an accident.

III. REVIEW PROCEDURES

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

The procedures outlined below are used to review CP applications, ESP applications, and COL applications that do not reference an ESP to determine whether data and analyses for the proposed site meet the acceptance criteria given in Subsection II of this SRP section. For reviews of OL applications, these procedures are used to verify that the data and analyses remain valid and that the facility's design specifications are consistent with these data. As applicable, reviews of OLs and COLs include a determination on whether the content of technical specifications related to the site location and description is acceptable and whether the technical specifications reflect consideration of any identified unique conditions.

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(1) For applications before January 10, 1997 the requirements are identified in 10 CFR 100.10 and 10 CFR 100.11.

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

1. Specification of Location: The information in this section of the SAR forms the basis for evaluations performed in other sections. The review serves to establish the validity of the basic data and to check the UTM coordinates and ensures that they include the zone number and that the northing and easting are presented to within 100 meters (328 feet). The staff will review latitude and longitude to ensure that they are expressed to the nearest second. The staff will review a scaled plot plan of the exclusion area, which permits distance measurements to the exclusion area boundary in each of the 22.5-degree sectors centered on the 16 cardinal compass points.

   If, in the reviewer's judgment, maps of larger scale are desirable, they may be obtained from USGS. The USGS map index should be consulted for the specific names of the 7.5-minute quadrangles that bracket the site area. These maps provide topographic information in addition to details of prominent natural and manmade features in the site area. This information may be supplemented by updated information as available (e.g., aerial photographs or information obtained on the site visit). The reviewer should examine the plant layout to determine that the orientation of plant structures with respect to nearby roads, railroads, and waterways is clearly shown. The reviewer should apply engineering judgment to confirm that there is no obvious way in which transportation routes that traverse the exclusion area can interfere with normal plant operations.

2. Site Area Map: The reviewer should cross-check the exclusion area distances with distances used in the accident analyses, SAR Chapter 15. The reviewer should scale the map provided to check distances specified in the SAR and to determine the distance-direction relationships to exclusion area boundaries, roads, railroads, waterways, and other significant features of the area. If applicable, at the OL stage, the staff will evaluate the location and orientation of plant structures and effluent release points with respect to the exclusion area and plant property boundaries, transportation routes, and political subdivisions to identify any changes since the CP review. Where changes have occurred, new analyses may be required to ensure that these changes do not affect the findings reached during the CP review.

3. Site Visits: For an ESP, CP, or COL review, a visit to the site under review permits a better understanding of the physical characteristics of the site and its relationship to the surrounding area. It permits the reviewer to gather information, independent of that supplied in the SAR. Site visits should be made after initial review of the site information in the SAR has been completed and the reviewer has become generally familiar with the site and surrounding areas. During the site visit, the reviewer will discuss the preliminary review findings with the applicant and obtain information from visits to local offices of Federal, State, and county governments, industries, military facilities, and other entities. Specific visits to these offices should be made on the basis of the particular site characteristics and is left to the judgment of the individual reviewer. Information should encompass, whenever possible, that needed to support the review of SRP Sections 2.1.3, 2.2.1-2.2.2, and 2.2.3.

4. Review Procedures Specific to 10 CFR Part 52 Application Type

   A. Early Site Permit Reviews: Subpart A to 10 CFR Part 52 specifies the requirements and procedures applicable to the Commission's review of an ESP application for approval of a proposed site. Information required in an ESP application includes a description of the site characteristics and design parameters of the proposed site. The scope and level of detail of review of data parallel that used for a CP review.

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 on the early site permit at the COL stage. Accordingly, the reviewer should ensure that all physical attributes of the site that could affect the design basis of SSCs important to safety are reflected in the site characteristics, design parameters, or terms and conditions on the early site permit.

B. Standard Design Certification Reviews: DC applications do not contain general descriptions of site characteristics because this information is site-specific and will be addressed by the COL or ESP applicant. Pursuant to 10 CFR 52.47(a)(1), a DC applicant must provide site parameters postulated for the design. However, the identification of site location and description are not applicable for this area of review.

C. Combined License Reviews: For a COL application referencing a certified standard design, the staff reviews that application to ensure sufficient information was presented to demonstrate that the characteristics of the site fall within the site parameters specified in the DC rule. Should the actual site characteristics not fall within the certified standard design site parameters, the COL applicant will need to demonstrate by some other means that the proposed facility is acceptable at the proposed site. This might be done by re-analyzing or redesigning the proposed facility.

For a COL application referencing an ESP, the staff reviews the application to ensure the applicant provided sufficient information to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the early site permit as applicable to this SRP section. Should the design of the facility not fall within the site characteristics and design parameters, the application should include a request for a variance from the ESP that complies with the requirements of 10 CFR 52.39 and 52.93.

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. The requirements of 10 CFR 52.39 preclude the Commission from changing or imposing new site characteristics, design parameters, or terms and conditions on an ESP, unless the change is necessary to assure adequate protection of the public health and safety or to bring the permit or site into compliance with the Commission's regulatory requirements in effect when the permit was issued. Consequently, the staff's review of a COL application referencing an ESP should not include a re-investigation of the site characteristics that have previously been accepted in the referenced 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 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 a DC.

For a COL application referencing either an ESP or DC or both, the staff should review the corresponding sections of the ESP and DC FSER to ensure that any unresolved items, commitments, assumptions, and differed issues identified in the FSERs are appropriately handled in the COL application.

IV. EVALUATION FINDINGS

The review should document the staff's evaluation of site characteristics against the relevant regulatory criteria. The evaluation should support the staff's conclusions as to whether the regulations are met. The staff should state what was done to evaluate the applicant's safety analysis report. The staff's evaluation may include verification that the applicant followed applicable regulatory guidance, performed independent calculations, and/or validation of appropriate assumptions. Summary descriptions of the site location, the site itself, and transportation routes on or near the site should be prepared for the staff safety evaluation report. If applicable, the evaluation should include the determination that normal use of transportation routes traversing the exclusion area will not interfere with normal plant operation. The staff may state that certain information provided by the applicant was not considered essential to the staff's review and was not reviewed by the staff. While the staff may summarize or quote the information offered by the applicant in support of its application, the staff should clearly articulate the bases for the staff's conclusions.

The staff verifies that the applicant has provided sufficient information and that the review and calculations (if applicable) support conclusions of the following type to be included in the staff's safety evaluation report. The staff also states the bases for those conclusions.

1. Construction Permit and Combined License Reviews

The following statements should be preceded by a summary of the site characteristics used for the plant:

> As set forth above, the applicant has presented and substantiated information to establish the site location and description. The staff has reviewed the information provided and, for the reasons given above, concludes that is sufficient for the staff to evaluate compliance with the siting evaluation factors in 10 CFR Part 100.3, as well as with the radiological consequence evaluation factors in 10 CFR 50.34(a)(1) for CPs, and 10 CFR 52.79(a)(1) for COLs. The staff further concludes that the applicant provided sufficient details about the site location and site description to allow the staff to evaluate, as documented in Sections 2.1.2, 2.1.3, and 13.3 and Chapters 11 and 15 of this SER, whether the applicant has met the relevant requirements of 10 CFR Part 52.79(a)(1) and 10 CFR Part 100 with respect to determining the acceptability of the site.

2. Early Site Permit Reviews

The following statements should be preceded by a summary of the site characteristics 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 the site location and description. The staff has reviewed the information provided and, for the reasons given above, concludes that the applicant has established site characteristics and design parameters acceptable to meet the requirements of 10 CFR 52.17(a)(1) and 10 CFR Part 100.3, as well as with the radiological consequence evaluation factors in 10 CFR 50.34(a)(1). The staff further concludes that the applicant provided sufficient details about the site location and site area to allow the staff to evaluate, as documented in Sections 2.1.2, 2.1.3, and 13.3 and Chapters 15 of this SER, whether the applicant has met the relevant requirements of 10 CFR 52.17(a)(1) and 10 CFR Part 100.

3. Design Certification Reviews

The site location and description is site-specific and will be addressed by the COL applicant.

V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of DC applications and license applications submitted by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52. Except when the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the staff will use the method described herein to evaluate 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, unless superseded by a later revision.

VI. REFERENCES

1. 10 CFR Part 20, "Standards for Protection Against Radiation," Subpart D, "Radiation Dose Limits for Individual Members of the Public."

2. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

3. 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

4. 10 CFR Part 100, "Reactor Site Criteria."

5. DG-1145, "Standard Format and Content of Combined License Applications for Nuclear Power Plants (LWR Edition)."

SRP Section 2.1.1
Description of Changes

This SRP section affirms the technical accuracy and adequacy of the guidance previously provided in (Draft) Revision 3, dated April 1996 of this SRP. See ADAMS accession number ML052070205.

In addition this SRP section was administratively updated in accordance with NRR Office Instruction, LIC-200, Revision 1, "Standard Review Plan (SRP) Process." The revision also adds standard paragraphs to extend application of the updated SRP section to prospective submittals by applicants pursuant to 10 CFR Part 52.

The technical changes are incorporated in Revision 3, dated 2007:

Review Responsibilities - Reflects changes in review branches resulting from reorganization and branch consolidation. Change is reflected throughout the SRP.

I. AREAS OF REVIEW

1. Made minor changes for clarity. They do not reflect any new staff positions.

2. Made changes to address CPs, OLs, DCs, ESPs, and COLs that are covered by these SRP sections.

II. ACCEPTANCE CRITERIA

1. Updated to include regulatory requirements of 10 CFR 52 to reflect ESP, DC, and COL applicants for licenses.

2. Updated to include RS-002 review comments.

III. REVIEW PROCEDURES

1. Updated with minor changes to improve clarity.

2. Included site visit to cover all potential license applications, including CPs, OLs, ESPs, and COLs.

IV. EVALUATION FINDINGS

1. Made minor changes to include regulatory requirements of 10 CFR Part 52 to reflect ESP, DC, and COL applicants.

V. IMPLEMENTATION

1. Made minor changes to improve clarity.

VI. REFERENCES

1. Included new reference, 10 CFR Part 52, to reflect potential ESP, DC, and COL applicants.