

2.4 SCOPING AND SCREENING RESULTS: STRUCTURES

Review Responsibilities

Primary - Branch responsible for plant systems

Secondary - None

2.4.1 Areas of Review

This section addresses the scoping and screening results of structures and structural components for license renewal. Typical structures include the following:

- The primary containment structure;
- Building structures (such as the intake structure, diesel generator building, auxiliary building, and turbine building);
- Component supports (such as cable trays, pipe hangers, elastomer vibration isolators, equipment frames and stanchions, and HVAC ducting supports);
- Nonsafety-related structures whose failure could prevent safety-related SSC from performing their intended functions (that is, seismic Category II over I structures).

Typical structural components include the following: liner plates, walls, floors, roofs, foundations, doors, beams, columns, and frames.

10 CFR 54.21(a)(1) requires the applicant to identify and list structures and components subject to an aging management review (AMR). These are “passive,” “long-lived” structures and components that are within the scope of license renewal. In addition, 10 CFR 54.21(a)(2) requires an applicant to describe and justify the methods used to identify these structures and components. The staff reviews the applicant’s methodology separately following the guidance in Section 2.1. To verify that the applicant has properly implemented its methodology, the staff focuses its review on the implementation results. Such a focus allows the staff to confirm that there is no omission of structures that are subject to an AMR by the applicant. If the staff’s review identifies no omission, the staff has a basis to find that there is reasonable assurance that the applicant has identified the structural components that are subject to an AMR.

An applicant should list all plant-level systems and structures. On the basis of the DBEs considered in the plant’s CLB and other CLB information relating to nonsafety-related systems and structures and certain regulated events, the applicant should identify those plant-level systems and structures within the scope of license renewal, as defined in 10 CFR 54.4(a). This is “scoping” of the plant-level systems and structures for license renewal. The staff reviews the applicant’s plant-level “scoping” results separately following the guidance in Section 2.2.

For structures that are within the scope of license renewal, an applicant must identify the structural components that are “passive” and “long-lived” in accordance with 10 CFR 54.21(a)(1)(i) and (ii). These “passive,” “long-lived” structural components are those that are subject to an AMR (“screening”). The applicant’s methodology implementation results for identifying structural components subject to an AMR is the area of review.

The applicant has the flexibility to determine the set of structures and components for which an AMR is performed, provided that this set includes the structures and components for which the NRC has determined that an AMR is required. This flexibility is described in the statements of consideration for the License Renewal Rule (60 FR 22478). Therefore, the reviewer should not focus the review on structural components that the applicant has already identified as subject to an AMR because it is an applicant's option to include more structural components than those subject to an AMR, pursuant to 10 CFR 54.21(a)(1). Rather, the reviewer should focus on those structural components that are not included by the applicant as subject to an AMR to ensure that they do not perform an intended function as defined in 10 CFR 54.4(b) or are not "passive" and "long-lived."

2.4.2 Acceptance Criteria

The acceptance criteria for the areas of review define methods for determining whether the applicant has met the requirements of NRC regulations in 10 CFR 54.21(a)(1). For the applicant's implementation of its methodology to be acceptable, the staff should have reasonable assurance that there has been no omission of structural components that are subject to an AMR.

2.4.2.1 Structural Components Subject to an Aging Management Review

Structural components are within the scope of license renewal as delineated in 10 CFR 54.4(a) if they are

- Safety-related SSCs that are relied upon to remain functional during and following DBEs [as defined in 10 CFR 50.49(b)(1)] to ensure the following functions:
 - The integrity of the reactor coolant pressure boundary;
 - The capability to shut down the reactor and maintain it in a safe shutdown condition; or
 - The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.
- All nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1)(i), (ii), or (iii).
- All SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), PTS (10 CFR 50.61), ATWS (10 CFR 50.62), and SBO (10 CFR 50.63).

Structural components are subject to an AMR if they are within the scope of license renewal and perform an intended function as defined in 10 CFR 54.4(b) without moving parts or a change in configuration or properties ("passive"), and are not subject to replacement based on a qualified life or specified time period ("long-lived") [10 CFR 54.21(a)(1)(i) and (ii)].

2.4.3 Review Procedures

The reviewer verifies the applicant's scoping/screening results. If the reviewer request additional information from the applicant regarding why a certain structure was not identified by the applicant as subject to an AMR for the plant, the reviewer should provide a focused question that clearly explain what information is needed, why the information is needed, and how the information will allow the staff to make its safety finding. In addition, other staff members review the applicant's scoping and screening methodology separately following the guidance in Section 2.1. The reviewer should keep these other staff members informed of findings that may affect their review of the applicant's methodology. The reviewer should coordinate this sharing of information through the license renewal project manager.

For each area of review, the following review procedures are to be followed:

2.4.3.1 Structural Components Within the Scope of License Renewal

In this step, the staff determines which structures and structural components are within the scope of license renewal. The Rule requires applicants, to identify structures that are subject to an AMR; not structures that are within the scope of license renewal (WSLR). Whereas in the past LRAs have included a table of structures that are WSLR, the staff does not expects that information to be submitted with future LRAs. Although that information will be available at plant sites for inspection, the reviewer must determine through sampling of P&IDs, and review of the FSAR and other plant documents, what portion of the components are within scope. The reviewer should check to see if any structures exist that the staff believes are within scope but are not identified by the applicant as being subject to an AMR (and request that the applicant provide justification for omitting those structures that are "passive" and "long lived").

2.4.3.2 Structural Components Subject to an Aging Management Review

In general, structural components are "passive" and "long lived." Thus, they are subject to an AMR if they are within the scope of license renewal. For each of the plant-level structures within the scope of license renewal, an applicant should identify those structural components that have intended functions. For example, the applicant may identify that its auxiliary building is within the scope of license renewal. For this auxiliary building, the applicant may identify the structural components of beams, concrete walls, blowout panels, etc., that are subject to an AMR. The applicant should justify omitting a component from an AMR that is within the scope of license renewal at their facility and is listed as "passive" on Table 2.1-5. Although Table 2.1-5 is extensive, it may not be all inclusive. Thus, the reviewer should use other available information, such as prior application reviews, to determine whether a component may be subject to an AMR.

As set forth below, the reviewer should focus on individual structure not subject to an AMR, one at a time, to confirm that the structural components that have intended functions have been identified by the applicant. In a few instances, only portions of a particular building are within the scope of license renewal. For example, a portion of a particular turbine building provides shelter for some safety-related equipment, which is an intended function, and the remainder of this particular building does not have any intended functions. In this case, the reviewer should verify that the applicant has identified the relevant particular portion of the turbine building as being within the scope of license renewal and subject to an AMR.

The reviewer should use the UFSAR, orders, applicable regulations, exemptions, and license conditions to determine the design basis for the SSCs. The design basis specifies the intended function(s) of the system(s). That intended function is used to determine the components within that system that are required for the system to perform its intended functions.

The reviewer should focus the review on those structural components that have not been identified as being within the scope of license renewal. For example, for a building within the scope of license renewal, if an applicant did not identify the building roof as subject to an AMR, the reviewer should verify that the roof has no intended functions, such as a "Seismic II over I" concern in accordance with the plant's CLB. The reviewer need not verify all structural components that have been identified as subject to an AMR by the applicant because the applicant has the option to include more structural components than the rule requires to be subject to an AMR.

Further, the reviewer should select functions described in the UFSAR to verify that structural components having intended functions were not omitted from the scope of the review. For example, if the UFSAR indicates that a dike within the fire pump house prevents a fuel oil fire from spreading to the electrically driven fire pump, the reviewer should verify that this dike has been identified as being within the scope of license renewal. Another example, if a non-safety-related structure or component is included in the plant's CLB as a part of the safe shutdown path resulting from the resolution of USI A-46, the reviewer should verify that the structure or component has been included within the scope of license renewal.

The applicant should also identify the intended functions of structural components. Table 2.1-4 provides typical "passive" structural component intended functions.

The staff has developed additional scoping/screening guidance. For example, some structural components may be grouped together as a commodity, such as pipe hangers, and some structural components are considered consumable materials, such as sealants. Additional guidance on these and others are contained in Section 2.1 for the following:

- Commodity groups
- Hypothetical failure
- Cascading
- Consumables
- Multiple functions

If the reviewer does not identify any omissions of components from those that are subject to an AMR, the staff would have reasonable assurance that the applicant has identified the components subject to an AMR for the structural systems.

Table 2.4-1 provides examples of structural components scoping/screening lessons learned from the review of initial license renewal applications and the basis for disposition.

If the applicant determines that a structural component may be subject to an AMR, the applicant should also identify the component's intended functions, as defined in 10 CFR 54.4. Such functions must be maintained by any necessary AMPs.

If the reviewer determines that the applicant has satisfied the criteria described in this review section, the staff would have reasonable assurance that the applicant has identified the components that are within the scope of license renewal and subject to an AMR.

2.4.4 Evaluation Findings

The reviewer verifies that the applicant has provided information sufficient to satisfy the provisions of the SRP-LR and that the staff's evaluation supports conclusions of the following type, to be included in the safety evaluation report:

The staff concludes that there is reasonable assurance that the applicant has appropriately identified the structural components subject to an aging management review in accordance with the requirements stated in 10 CFR 54.21(a)(1).

2.4.5 Implementation

Except in those cases in which the applicant proposes an acceptable alternative method for complying with specific portions of NRC regulations, the method described herein will be used by the staff in its evaluation of conformance with NRC regulations.

2.4.6 References

None.

Table 2.4-1. Examples of Structural Components Scoping/Screening and Basis for Disposition

Example	Disposition
Roof of turbine building	An applicant indicates that degradation or loss of its turbine building roof will not result in the loss of any intended functions. The turbine building contains safety-related SSCs in the basement, which would remain sheltered and protected by several reinforced concrete floors if the turbine building roof were to degrade. Because this roof does not perform an intended function, it is not within the scope of license renewal.
Post-tensioned containment tendon gallery	The intended function of the post-tensioning system is to impose compressive forces on the concrete containment structure to resist the internal pressure resulting from a DBA with no loss of structural integrity. Although the tendon gallery is not relied on to maintain containment integrity during DBEs, operating experience indicates that water infiltration and high humidity in the tendon gallery can contribute to a significant aging effect on the vertical tendon anchorages that could potentially result in loss of the ability of the post-tensioning system to perform its intended function. However, containment inspections provide reasonable assurance that the aging effects of the tendon anchorages, including those in the gallery, will continue to perform their intended functions. Because the tendon gallery itself does not perform an intended function, it is not within the scope of license renewal.
Water-stops	Ground water leakage into the auxiliary building could occur as a result of degradation to the water-stops. This leakage may cause flooding of equipment within the scope of license renewal. (The plant's UFSAR discusses the effects of flooding.) The water-stops perform their functions without moving parts or a change in configuration, and they are not typically replaced. Thus, the water-stops are subject to an AMR. However, they need not be called out explicitly in the scoping/screening results if they are included as parts of structural components that are subject to an AMR.