CARBON FREE
POWER PROJECT

August 02, 2022 Docket No. 99902052

Mr. Robert M. Taylor
Deputy Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Excavation supports as a preconstruction activity

Dear Mr. Taylor:

The Carbon Free Power Project (CFPP) seeks to clarify the appropriate interpretation of "construction" as defined by 10 CFR 50.10(a). In preparing the CFPP site for nuclear construction, CFPP intends to excavate for the NuScale reactor building in advance of receiving a combined license (COL), including supports within the excavation to ensure worker safety. Because the excavation supports will be constructed for the purposes of worker safety, and not for or serving any nuclear safety or security purpose, CFPP believes the supports are properly excluded from the scope of "construction" requiring NRC permission. Due to the depth of the excavation for NuScale plants, it is expected that similar worker safety measures will be used at most sites.

Background

In preparing the CFPP site for nuclear construction, CFPP intends to excavate for the NuScale reactor building in advance of receiving a COL. With respect to NRC requirements such excavation is, on its own, allowable as it is clearly excluded from construction by 10 CFR 50.10(a)(2)(v). In order to ensure worker safety during excavation, CFPP will install excavation supports within the excavation. At CFPP, the planned excavation supports will be composed of "tie backs"—lateral anchors installed in the excavation wall—and a thin, non-structural, sprayed-concrete excavation lining to stabilize the exposed rock walls.

Issue

Although the excavation supports serve no nuclear safety or security purpose, they will be abandoned in place prior to backfilling the excavation and thus would constitute a "permanent" installation (including concrete) within the excavation. Ambiguous regulatory phrasing and guidance raises the question of whether such an installation is intended to be considered as construction requiring NRC permission under 10 CFR 50.10.

CFPP concludes that the correct regulatory interpretation, as informed by the intent and history of 10 CFR 50.10, is that the excavation supports are not considered nuclear construction because they have no reasonable nexus to nuclear safety or security.

CFPP's construction plan may evolve to necessitate different excavation supports, and excavations at future sites for the NuScale or other reactor designs will likely utilize similar excavation supports, such as sheet piles. These systems have in common a permanent installation within an excavation installed only for construction and worker safety purposes, serving no function with respect to the completed nuclear facility. While this letter focuses on CFPP's proposed tie-backs and concrete liner, CFPP seeks generic clarification applicable to other comparable approaches.

CFPP's Interpretation

10 CFR 50.10(a)(1) defines construction in pertinent part as: "subsurface preparation, placement of backfill, concrete, or permanent retaining walls within an excavation [or] installation of foundations . . . which are for" the listed SSCs of a facility, including safety-related SSCs.

The excavation supports for CFPP are within an excavation for the safety-related reactor building, and include concrete within the excavation. Thus, whether the supports comprise construction comes down to a critical distinction in two plausible interpretations of the definition: whether construction constitutes either: (a) installing the defined features in an excavation, where the excavation is "for" a safety-related SSC, *or* (b) installing the defined features within an excavation, where the feature is "for" a safety-related SSC. Based on the regulatory structure, history, and intent CFPP concludes that the latter interpretation is correct. The excavation supports at the CFPP site will be only "for" the excavation; they will not perform or support a function of the reactor building itself. Thus, they would not be considered nuclear construction under CFPP's interpretation.

The text of the definition, while ambiguous, supports CFPP's interpretation. The definition uses the plural phrasing "which are for," which suggests it is intended to modify the "placement of backfill, concrete, or permanent retaining walls." Read otherwise, construction would agrammatically be defined as "excavation…which are for" the listed SSCs.

The preamble to the final rule explaining the intended scope of excavation is unclear, but also supports CFPP's interpretation. In certain instances, NRC suggested that the determinative consideration was whether a feature installed in an excavation is permanent or temporary:

> *[Construction includes the] placement of permanent SSCs that are put into the excavation during or after the excavation (e.g., installation of permanent drainage systems, or placement of mudmats). If the erosion control measures are conducted outside of the excavated hole and do not cover up the exposed soil conditions, then those activities would be allowed under § 50.10(a). However, under the final LWA rule, the placement of temporary SSCs in the excavation, such as retaining walls, drainage systems, and erosion control barriers, all of which are to be removed before fuel load, would not be considered construction. [72 FR 57,416, at *19.]*

NRC guidance echoes this temporary versus permanent distinction (*see* Regulatory Guide (RG) 1.206, Rev. 1, p. 117). This distinction appears to rely at least in part on the covering up of exposed soil conditions. However, in a preceding discussion in the Statements of Consideration, NRC clearly establishes that the applicant's responsibilities to accurately characterize the parent material and to demonstrate that site conditions are acceptable "exist[] regardless of whether or not the NRC … inspects the excavation activities as they are accomplished" [*id.*]. The Staff's commission paper further explains:

> *10 CFR 52.6 provides an equally acceptable way of ensuring public health and safety if excavation is eliminated from the definition of construction for those limited situations where excavation activities uncover potentially adverse geologic, soil and hydrological conditions not anticipated by the applicant or excavation activities cause unanticipated damage to surrounding native rock. [SECY-07-0030, p.6.]*

An applicant's responsibilities to completely and accurately describe and characterize the site conditions exposed during excavation exist whether the excavation walls are partially covered by a concrete liner or not. Thus the Staff's rationale applies to both the excavation itself and potential installations within the excavation. Another portion of the preamble helps clarify:

> *[T]he placement of permanent, non-structural dewatering materials, mudmats and/or engineered backfill which are placed in advance of the placement of the foundation and associated permanent retaining walls <u>for SSCs within the scope of the definition of construction</u> are not excavation activities, but instead fall within the scope of construction. [72 FR 57,416, at *32; emphasis added.]*

This statement aligns with CFPP's interpretation: whether installation within an excavation is construction is based not only on whether the installation is permanent, but also whether that permanent feature is "for SSCs" that are within the scope of construction. Understood this way, the permanence of a feature can be understood as an indication of whether the feature serves a function in the completed facility rather than whether it covers up soil conditions (since removing such a feature after plant construction but before fuel load would be an ineffective mitigation of concerns over covering up exposed soil conditions).

In addition to the rule language and regulatory history, CFPP looks to the NRC's regulatory intent to conclude that CFPP's excavation supports are not construction because it has no reasonable nexus to nuclear safety or security. The scope of construction in 10 CFR 50.10(a) is intended to identify "activities that have a reasonable nexus to radiological health and safety and/or common defense and security for which regulatory oversight is necessary and/or most effective in ensuring reasonable assurance of adequate protection to public health and safety or common defense and security" (72 FR 57,416 at *26). That reasonable nexus exists where a feature <u>itself</u> serves a purpose related to nuclear safety, versus one that can merely have a minor impact on the performance of other SSCs at the facility—SSCs that will subsequently be reviewed in light of all relevant information to conclude they provide for reasonable assurance of adequate protection.

Other activities that are clearly defined as construction have their own purpose related to nuclear safety or security and would necessitate a demonstration of adequacy for that purpose and a safety finding during licensing. For example, a permanent drainage or dewatering system must adequately perform its function to limit water intrusion into the SSCs of the completed plant; a permanent mudmat or retaining wall serve to structurally support SSCs in the completed plant. These features have specified design characteristics and perform functions that would be reviewed and safety findings made during a licensing review. A comparable process would need to occur via an LWA under NRC's current regulatory approach.

By contrast, excavation supports such as CFPP's will serve no function in the completed plant. The excavation outside the reactor building will be backfilled with qualified material and structural analysis will show that the reactor building is structurally acceptable in light of the surrounding conditions, including any impact the tie-backs and liner may have. To the extent the excavation supports are addressed in a COLA FSAR, it would be only as an input into the reactor building seismic analysis. CFPP expects that effect to be small (note that preliminary evaluation by NuScale engineering is that the tiebacks planned for CFPP yield insignificant soil-seismic interactions). In any case, that effect would be considered in the design of the reactor building itself and evaluated as necessary to demonstrate acceptability, which will be reviewed by the NRC during a subsequent licensing process.

Thus, even though the tie-backs and liner prevent collapse of the excavation walls upon workers during construction, they are not a retaining wall or concrete installed "for" a listed SSC; a retaining wall "for" the reactor building would be one that supports the loads of the reactor building. Other allowed non-construction activities could have comparable effects as the excavation supports. For example, the rule would not prohibit an applicant from constructing an administrative building immediately adjacent to a future safety-related building. The administrative building could contribute structure-structure interactions in the safety-related building's seismic analysis and could be a source of hazards for the safety-related building for which protection needs to be provided. Both would need to be considered in the latter's design and licensing process, not in an LWA review.

The consideration of piles as construction in the 10 CFR 50.10 rulemaking illustrates this differentiation. The NRC concluded that only the "driving of piles for certain SSCs" had the requisite "reasonable nexus" to nuclear safety and security to be considered construction. Piles for the listed SSCs will have via the LWA process "early resolution of safety issues associated with" the piles (*id.* at *28), which would consider the design of the piles to support the loads of those future SSCs. A pile not "for" a listed SSC does not require an LWA, even if it could potentially interact with a future safety-related building, because there are no safety issues associated with the pile itself. To require an LWA for an excavation support not based on the function the support serves, but rather the purpose of the excavation, would conflict with the LWA's "reasonable nexus to safety" intended scope.

Conclusion

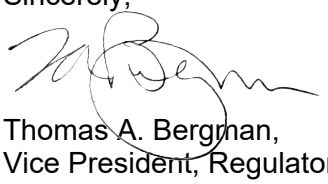
CFPP concludes that excavation supports constructed only for the purposes of worker safety, and not for or serving any nuclear safety or security purpose, are properly excluded from scope of “construction” requiring NRC permission because they do not have a reasonable nexus to nuclear safety or security. This interpretation is consistent with the 10 CFR 50.10(a) definition of construction, where the construction activities within an installation are understood to be those that are constructed “for” (i.e. serving a function related to) a listed SSC, such as a safety-related building. Construing the regulation as such harmonizes ambiguous and potentially contradictory discussion in the regulatory and guidance, and properly aligns the scope of construction with NRC’s regulatory authority and intent.

In order to support ongoing planning and application development activities, CFPP seeks expedited resolution of this issue. Therefore, CFPP requests a public meeting with NRC, CFPP, and the Department of Energy at the soonest opportunity to reach alignment on this issue and related LWA matters. CFPP also requests NRC Staff respond to this letter, either directly or in a meeting summary after the public meeting, if held, to confirm this interpretation. While such response is sufficient to clarify the regulation and RG 1.206 guidance in the interim, future clarification of NRC’s position in RG 1.206 or a future rulemaking would benefit industry’s understanding and consistent implementation.

This letter makes no regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions, please contact John Volkoff at 541-452-7117 or at jvolkoff@nuscalepower.com.

Sincerely,



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