

Supplement – Definition of Construction Interim Staff Guidance on Limited Work Authorizations

Purpose:

The purpose of this supplement to draft interim staff guidance (ISG) COL/ESP-ISG-004 is to provide additional clarifications and examples related to the definition of construction and the delineation of preconstruction activities and those activities requiring prior Nuclear Regulatory Commission (NRC) approval. The issuance of this supplement was discussed at a public meeting held on June 12, 2008. A summary of that meeting is available in the NRC's Agency wide Document Access and Management System (ADAMS), Accession No. ML081720507. The Nuclear Energy Institute (NEI) subsequently provided discussions of several examples in a letter dated July 11, 2008 (ADAMS No. ML082120123). Following its evaluation of public comments, the NRC staff will add these or similar clarifications and examples to the final ISG.

It is important to recognize that although preconstruction activities can be performed without prior NRC approval, various local, state, or other federal permits may be required. In addition, some preconstruction activities may come under the NRC's regulatory authority for other reasons, such as the requirement to verify by inspections, tests, analyses, and acceptance criteria (e.g., procurement of components).

Background:

This supplement addresses the definition of *construction*, as set forth in Section 50.10, "License required; limited work authorization," of Title 10 of the *Code of Federal Regulations* (10 CFR 50.10). In the recent revision to the limited work authorization (LWA) rule (72 FR 57416; October 9, 2007), the NRC revised the definition of construction to exclude those activities that have no reasonable nexus to radiological health and safety or common defense and security (e.g., site clearing and grading). For the final LWA rulemaking, the scope of structures, systems, and components (SSCs) falling within the definition of construction was initially derived from the scope of SSCs that are included in the program for monitoring the effectiveness of maintenance at nuclear power plants, as defined in 10 CFR 50.65(b), and supplemented with additional criteria. A discussion of the definition of construction and guidance on the delineation of preconstruction and construction activities was provided in the supplementary information published with the final rule. As discussed in the supplementary information, the NRC selected the criteria used in the definition of construction to take advantage of the work done during the development and implementation of the maintenance rule (10 CFR 50.65). The maintenance rule also defines a scope of SSCs that have some nexus to radiological health and safety (safety significance).

The selection of the maintenance rule criteria for use in the definition of construction was, in part, because the criteria are well understood and there is good agreement on its implementation. In addition, guidance documents for implementing the maintenance rule have been prepared and tested. Guidance for implementing the maintenance rule is provided in Regulatory Guide (RG) 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." RG 1.160 endorses industry guidance provided in Revision 2 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (April 1996). For these reasons, the NRC has decided that the maintenance rule guidance can also be applied to determinations of SSCs that are within the scope of the definition of

Enclosure

construction. Also, the NRC recognizes that determinations of SSCs that have a reasonable nexus to radiological health and safety or common defense and security will be dependent upon the design of the facility.

In addition to the criteria in 10 CFR 50.10(a)(1)(i – vii) that are used to determine the scope of SSCs that fall within the definition of construction, the final LWA rule also specifies criteria in 10 CFR 50.10(a)(1) for construction activities that take place within the excavation for SSCs that fall within the definition of construction. Therefore, the definition of construction includes: any change made to the parent material in which the excavation occurs (e.g., soil compaction, rock grouting); the driving of piles; the installation of foundations; the installation of permanent drainage systems and geofabric; the placement of backfill, concrete (e.g., mudmats) or other materials which will not be removed before placement of the foundation of a structure; the placement and compaction of a subbase; and the installation of reinforcing bars to be incorporated into the foundation of any SSC fall within the scope of construction.

The above definition includes use of the “temporary” and “permanent” criteria that are discussed in the statement of considerations for the final LWA rule. The term “permanent” in this context, includes anything that will exist in its final, in-place plant location after fuel load. By contrast, the term “temporary” means anything that will be removed from the excavation before fuel load. Therefore, the installation of permanent retaining walls within an excavation and the erection of concrete forms for the foundations that will remain in-place permanently (even if non-structural) fall within the definition of construction. However, if erosion control measures are conducted outside of the excavated hole and do not cover up the exposed soil conditions, then those activities would be considered preconstruction.

Discussion of examples:

The industry has raised several questions related to specific SSCs in response to the draft ISG because of their recent evaluations of site-specific construction plans. In addition to the background discussion provided above, the following examples are used to provide clarification on the delineation of preconstruction and construction activities. It should be noted that while the preconstruction activities do not require prior NRC approval, various local, state, or other federal permits may be required.

Circulating Water System

Several questions were raised during the June meeting and subsequent NEI letter that relate to circulating water systems. Unless otherwise justified, the NRC staff considers the circulating water system, on a system level, to be within the scope of construction due to the requirement in 10 CFR 50.10(a)(1)(iv) related to equipment that can cause a reactor trip. Although the system and active equipment such as pumps and valves can cause a plant trip, the NRC staff believes that the guidance can be further clarified to support a different finding for specific portions of some circulating water systems:

- Buried Circulating Water System Piping up to the Turbine Building:

An applicant could make a case that plausible failures (leakage) associated with the circulating water system (CWS) piping (intake and discharge) would not result in a reactor trip. It is reasonable to exclude the piping from the scope of construction for certain designs

given that the reactor trip or safety system actuation criterion is the only reason to consider it within scope. This finding remains consistent with the NRC's decision to use the maintenance rule and related guidance to define the scope of SSCs within the definition of construction. RG 1.160 provides the following guidance for systems to include for this criterion:

- (1) SSCs whose failure has caused a reactor scram or actuation of a safety-related system at their site
- (2) SSCs whose failure has caused a reactor scram or actuation of a safety-related system at a site with a similar configuration
- (3) SSCs identified in the licensee's analysis (e.g., final safety analysis report (FSAR), individual plant evaluation) whose failure would cause a reactor scram or actuation of a safety-related system.

A review of the licensee event reports for currently operating reactors did not identify occurrences of CWS piping failures up to the turbine building that resulted in plant scrams or safety system actuations. The turbine building demarcation may be important since the piping within the building could, depending on plant design, cause internal plant flooding, cause safety system actuations, or prevent other SSCs from fulfilling their safety-related functions. Design specific reviews are also required to ensure that CWS piping failures up to the turbine building are not identified in other analyses (e.g., FSAR, probabilistic risk assessment) as being a plausible initiating event for a reactor scram or safety system actuation. Therefore, CWS piping could be considered preconstruction in certain circumstances.

- Circulating Water Intake Structure

An applicant could make a case, similar to that for CWS piping up to the turbine building, for the plant intake structures that do not have a safety function. This conclusion would not apply to related SSCs such as pumps, travelling screens, or other active components associated with the CWS because there are numerous examples of plant transients and safety system actuations that have loss of circulating water flow as an initiating event. To expand the preconstruction activities beyond the intake structure, design specific reviews are required to ensure that a loss of CWS flow due to pump failures or screen blockage are not a plausible initiating event for a reactor scram or safety system actuation. Therefore, the determination on whether Intake Structures and related components are in scope depends on facility design.

- Cooling Towers

An applicant could make a case, similar to that for intake structures, for cooling tower structures when the structures do not have a safety function. This conclusion may not apply to related SSCs such as pumps associated with the CWS because there are examples of plant transients and safety system actuations that have loss of circulating water flow as an initiating event. To expand the preconstruction activities beyond the cooling tower structure, design specific reviews are required to ensure that a loss of circulating water system flow due to loss of pumps or other components is not a plausible initiating event for a reactor

scram or safety system actuation. Therefore, the determination on whether cooling towers and related components are in the scope of construction depends on facility design.

Turbine Building Structure or Foundation

The turbine/generator system is within the scope of construction because failure of the turbine/generator could cause a reactor scram. However, an applicant could make a case that plausible failure of the turbine building structure or foundation (settling), would not result in a reactor scram or safety system actuation. Depending on the facility design, the turbine building structure or foundation may not fall within the scope of construction, if the reactor scram or safety system actuation criterion is the only reason to consider it.

Temporary or Permanent Features

Requested clarifications from the public meeting and NEI letter involve the distinction between temporary and permanent construction features (e.g., retaining walls and dewatering systems). The following points apply to the distinctions between temporary and permanent features:

- 1) As discussed in the supplementary information for the final LWA rule, excavation and other site preparation activities, whether permanent or temporary, are outside the scope of construction and are considered preconstruction. For example, piles driven to support the erection of a bridge for a temporary or permanent access road would not be considered as construction and may be performed without an LWA, construction permit, or combined license;
- 2) Installation of a temporary feature within the excavation or area associated with construction that will be removed during construction is considered to be a preconstruction activity. Such features include some retaining walls, some types of dewatering systems, ramps, and other structures that have no physical presence following construction; and
- 3) Regarding installation of temporary features within the excavation during preconstruction, if the applicant proposes to abandon the subject feature in place, NRC approval of that action (i.e., abandonment) would be required as part of an LWA or COL application. Examples may include certain retaining walls and some types of dewatering systems. The applicant would need to justify and the NRC approve that the abandoned feature would not adversely affect the SSCs, introduce undesirable flow paths, or otherwise conflict with nuclear plant safety or regulatory compliance. Consideration should be given to the fact that applicants that notify the NRC that they will be requesting an LWA after they have submitted their COL application do so at the risk of impacting their COL review schedule.

Construction Crane Foundations and Support Pads

Construction includes those permanent features (e.g., retaining walls and foundations) that are placed within the necessary excavations for SSCs within the definition of construction. Site preparation activities that are performed outside of the construction excavations are considered preconstruction. Therefore, installation of foundations and support pads that are placed outside of the necessary excavations for SSCs within the definition of construction would be

preconstruction. A necessary excavation is an excavation that is sufficient to provide construction access to the structures that fall within the definition of construction. Applicants will need to ensure that these preconstruction activities are separate from and do not result in adverse interactions with construction related SSCs including influence on the stability (static and dynamic) analyses.

Final Resolution:

The issue will be resolved in the next revision to RG 1.206 and related guidance documents.

Applicability:

This ISG is applicable to all early site permit, CP, or COL applicants requesting authorization to perform limited work activities or considering actions as preconstruction activities.

References:

- (1) "Limited Work Authorizations for Nuclear Power Plants; Final Rule," Volume 72, p. 57415, of the *Federal Register*, October 9, 2007.
- (2) RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," June 2007.
- (3) RG 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."
- (4) NUREG-1648, "Lessons Learned from Maintenance Rule Baseline Inspections," October 1999.
- (5) NUMARC 93-01, Revision 2, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," April 1996.