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U7-C-STP-NRC-090176
November 16, 2009
10 CFR 50.10

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
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Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Request for a Limited Work Authorization
for Installation of Crane Foundation Retaining Walls

STP Nuclear Operating Company (STPNOC) has submitted an application for combined licenses (COLs) for South Texas Project (STP) Units 3 and 4, and the NRC has docketed that application. In order to perform construction and installation activities, STPNOC will need to utilize construction cranes. The purpose of this letter is to request that the NRC issue a Limited Work Authorization (LWA) in accordance with 10 CFR 50.10(d) that will authorize the installation of crane foundation retaining walls (CFRW) for Units 3 and 4, if the NRC concludes that prior approval is required. The attachments to this letter explain the reasons for STPNOC's conclusion that prior NRC approval is not required for CFRW installation, and also provide a request for an LWA if the NRC determines that prior approval is required.

In a public meeting with the NRC on September 30, 2009, STPNOC described the planned preconstruction activities for STP Units 3 and 4 and the process utilized by STPNOC to determine if these activities require prior NRC approval under 10 CFR 50.10. In addition, STPNOC described the application of this process to the installation of the CFRW, and the reasons for concluding that the CFRW are not permanent retaining walls for any of the structures, systems or components (SSCs) for which prior NRC approval is required under either 10 CFR 50.10(c) or (d) nor are the CFRW within the excavation required for any SSCs for which NRC approval is required under 10 CFR 50.10 (c) or (d). STPNOC also provided a more detailed description of the analyses that further support the conclusion that the CFRW do not have a reasonable nexus to safety. The NRC indicated that, as part of an acceptance review of a request for LWA for this activity, it would determine whether the CFRW installation for Units 3 and 4 requires authorization.

Attachment 1 provides an assessment of the application of 10 CFR 50.10 to the CFRW, which shows that the CFRW will not be installed within the excavation required for the SSCs for which prior NRC approval is required, that the CFRW are not required for any SSC for which NRC

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approval is required, that the CFRW are installed solely for the purpose of supporting cranes used to construct STP Units 3 and 4, and that the CFRW do not have a reasonable nexus to the safety of Units 3 and 4.

Attachment 2 provides the safety analysis required by 10 CFR 50.10(d)(3)(i) and describes the CFRW and the technical analyses of the effect of the CFRW on the safety of STP Units 3 and 4. The analyses demonstrate that the CFRW installation has no adverse interactions with SSCs identified in 10 CFR 50.10(a)(1), including influence on the stability (static and dynamic) analyses.

Attachment 3 provides STPNOC's formal request for an LWA to authorize installation of the CFRW for STP Units 3 and 4, for consideration by the NRC if it concludes that such approval is required. STPNOC is submitting this request in two parts. Attachment 3 provides the first part and is supported by the information provided in Attachment 2. The second part of the LWA request consists of the information required by 10 CFR 50.10(d)(3)(ii) and (iii), and will promptly be submitted if, during the acceptance review, the NRC provides notice that CFRW installation requires authorization.

Preparation for installation of the CFRW is ongoing, with final installation activities planned to begin no later than November 1, 2010. Since CFRW installation is a critical path activity for the construction of STP Units 3 and 4, STPNOC requests that the NRC make a determination on this principal issue as soon as practicable. In view of the critical nature of the CFRW installation and the current stage of NRC review of the COL application, if the NRC determines that prior approval is required for CFRW installation, then STPNOC also requests an early meeting to discuss the NRC's schedule for the LWA process.

There are no commitments in this letter.

I declare under penalty of perjury that the foregoing information is true and correct.

Executed on 11/16/2009



Edward D. Halpin
Executive Vice President & Chief Nuclear Officer

Attachments:

1. Crane Foundation Retaining Wall Installation Activity, Preconstruction Screening Evaluation
2. Crane Foundation Retaining Wall Evaluation Summary
3. Request for Limited Work Authorization for the Crane Foundation Retaining Wall Installation

cc: w/o attachment except*
(paper copy)

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Attachment 1

Crane Foundation Retaining Wall Installation Activity, Preconstruction Screening Evaluation

Crane Foundation Retaining Wall Installation Activity, Preconstruction Screening Evaluation

A. Introduction and Purpose

As discussed in the transmittal letter, as a result of the meeting on September 30, 2009, STP Nuclear Operating Company (STPNOC) agreed to submit a screening evaluation of the crane foundation retaining walls (CFRW) installation. This evaluation is provided below.

Information in this attachment, as supported by the safety analyses described in Attachment 2 to this letter, is provided by STPNOC to support NRC review of this preconstruction screening evaluation. This evaluation supports STPNOC's conclusion that installation of the CFRW does not constitute a construction activity within the meaning of that term in 10 CFR 50.10(a)(1) and is neither within the excavation required for construction of any SSCs for which NRC approval is required nor are they for any SSCs for which NRC approval for construction is required. As a follow-up to the meeting referenced above, STPNOC requests that the NRC review this information and make a determination of whether or not a request for a Limited Work Authorization (LWA) is required.

The scope of this preconstruction screening evaluation comprises the CFRW installation and no other activity.

B. CFRW Role, Location, and Description

NOTE: Distances, where provided below, are approximated.

1. Role of CFRW in Site Preparation and Excavation Activities.

Planning for the STP Units 3 and 4 preconstruction sequence includes the in situ installation of CFRW prior to excavations for plant construction, i.e., the CFRW will be installed prior to the commencement of any nearby excavation activities. The CFRW are described in Final Safety Analysis Report (FSAR) Section 2.5S.4.5.2.4¹. As discussed in this section, the "retaining wall is required to accommodate the reach of a heavy lift crane needed to place the reactor vessels." In addition, the crane will be used for other major lifts in support of the modular construction of the facility. The FSAR further states that "the sole purpose of these walls is to facilitate excavation activities" by retaining soil next to the excavations of the Reactor Building (R/B), Control Building (C/B), and Turbine Building (T/B) foundations, allowing the crane areas to be at grade and near the buildings. As such, the wall installation is a construction aid and an element of site preparation. The CFRW are used only during plant construction activities. The CFRW are permanent structures, since they will be abandoned in-place, having no permanent facility function.

The CFRW are located to the east side of each unit and generally extend, in a North-South

¹ FSAR references pertain to Revision 3 (Reference 2).

line, from south of the R/B to north of the T/B. FSAR Figure 2.5S.4-48 illustrates the Units 3 and 4 overall excavation plan and notes the location of the walls, relative to each unit. The CFRW for each unit are labeled in that figure as the "concrete retaining wall." See also Figure 1a in this attachment, which is an annotated version of FSAR Figure 2.5S.4-48. The location of the CFRW is established to support the installation of the crane pads. The CFRW are located outside the excavation required for sufficient construction access to the structures, systems, and components (SSCs) for which prior NRC approval is required by either a construction permit (CP) or combined license (COL) under 10 CFR 50.10(c) or a LWA under 10 CFR 50.10(d). As discussed later, the CFRW have no adverse interactions with these SSCs, including influence on the stability (static and dynamic) analyses and are not for any SSCs for which NRC approval for construction is required.

2. Location of CFRW Relative to Construction Activities.

As noted above, an annotated version of FSAR Figure 2.5S.4-48 is provided in this attachment as Figure 1a. Figure 1b shows a cutaway view showing the relative location of the CFRW to the R/B. Figure 2a is a simplified illustration showing the relative locations of the crane area, the CFRW, and the excavation required for SSCs for which prior NRC approval is required under either 10 CFR 50.10(c) or (d). The referenced figures are general illustrations of the arrangement of plant structures and do not precisely represent separation distances. However, the approximate separation distances between the CFRW and the structures described below will be met during plant construction. The CFRW location provides a generally uniform minimum separation distance of approximately 15 feet from structure walls of SSCs identified in 10 CFR 50.10(a)(1).

The required crane location is established based on the effective reach of the crane. The base of the crane must be close enough to support required lifts during construction. Therefore, the CFRW are appropriately positioned relative to the crane pads and foundations. As noted in Figure 2a, the distance between the CFRW and crane is approximately 20 feet.

In accordance with planned plant preconstruction activities, the CFRW will be installed in situ, prior to the commencement of any nearby excavation activities. Excavation will extend up to the installed CFRW for convenience of the excavating process; however, the CFRW are not within the excavation area for SSCs for which prior NRC approval is required under either 10 CFR 50.10(c) or (d).

The closest separation distance from the CFRW and the nearest edge of a Seismic Category I building (i.e., the R/B) is 15 feet. The excavation required for sufficient construction access to the R/B is 10 feet from the R/B exterior wall. Therefore, the CFRW are beyond the boundary of the excavation required for sufficient construction access for the R/B, as well as the C/B and T/B, by a minimum of approximately 5 feet. Figure 2b illustrates these relative distances, applicable to the R/B, C/B, and T/B.

The Service Building (S/B) is not a Category I building, but is within the scope of section 50.10(a)(1) because it contains the Technical Support Center (TSC). The foundation wall on the east side of the S/B is separated from the CFRW by 15 feet. As with the R/B, this

horizontal distance provides sufficient access for construction activities. Thus, the CFRW is beyond the excavation required for sufficient construction access for the S/B. Similarly, one of the Diesel Fuel Oil Storage Vaults is separated from the CFRW by 15 feet to the structure wall and 11 feet to the edge of the foundation. This distance provides sufficient construction access; therefore, the CFRW is beyond the excavation required for this structure.

3. Physical Description and Installation of the CFRW.

As discussed in FSAR Section 2.5S.4.5.2.4, the CFRW are non-safety related, reinforced concrete walls. One CFRW is installed on the east side of each unit. The installation method utilizes an in situ “slurry trench” method, as described in FSAR Section 2.5S.4.5.4.4. During subsequent excavation, the exposed height of the CFRW is expected to vary up to a maximum of 90 feet. Lateral support for the CFRW is provided by a tieback and whaler system, as described in FSAR Section 2.5S.4.5.2.4. The CFRW are construction aids provided for the purpose of supporting cranes used during construction.

The area on the west side of the CFRW will be backfilled as construction progresses, and the wall will be abandoned in place following crane use.

C. Preconstruction Screening Evaluation

This section discusses criteria utilized in determining if the CFRW installation requires prior NRC approval under 10 CFR 50.10.

1. Installation activities listed under 10 CFR 50.10(a)(2), that is, not included under “construction.”

10 CFR 50.10(a)(2)(iii) covers preparation of a site for construction of a facility. As discussed above and in FSAR Section 2.5S.4.5.2.4, the CFRW installation is required to support installation of the heavy lift crane at grade level and near the R/B, C/B, and T/B. As such, the CFRW installation is a construction aid and is part of overall site preparation activities.

In that the CFRW installation is a preconstruction activity under 10 CFR 50.10(a)(2), no additional screening would normally be addressed. However, for thoroughness and completeness in supporting NRC Staff review, the following considerations are addressed in this evaluation.

2. Consideration of the installation activity in terms of permanent facility function.

As stated in Section B above, the CFRW will be abandoned in place and is therefore a permanent structure. However, the CFRW are non-safety related (FSAR Section 2.5S.4.5.2.4) and are construction aids that have no function related to the permanent facility and are not for any SSCs for which NRC approval is required for construction.

3. Relationship of the installation activity to the excavation required for sufficient construction access.

As discussed in Section B.1 above, the CFRW are located outside the excavation required for sufficient construction access to the SSCs for which prior NRC approval is required under 10 CFR 50.10(c) or (d). Section 50.10 recognizes that the actual excavated area will include both (1) areas related to SSCs identified under 10 CFR 50.10(a)(1), along with sufficient construction access, as well as (2) areas under 10 CFR 50.10(a)(2) related to other SSCs or for construction convenience. The determination of which portions of an excavation are considered required for sufficient construction access to SSCs identified in 10 CFR 50.10(a)(1) is made by technically defining the area required for actual construction of these SSCs and the area beyond which there would be no significant influence on these SSCs.

As supported in Attachment 2 to this letter, the safety analyses demonstrate that the CFRW have no adverse interactions with SSCs as identified in 10 CFR 50.10(a)(1), including influence on the stability (static and dynamic) analyses.

4. Installation activities requiring NRC approval for construction under 10 CFR 50.10(c) or (d).

The CFRW is not for an SSC for which NRC approval is required for construction per 10 CFR 50.10(c) or (d) and as identified in 10 CFR 50.10(a)(1).

It is important to note that while the term “retaining walls” is used in 10 CFR 50.10, it is clear in 10 CFR 50.10(c) and (d) that this term applies to retaining walls “which are for” the SSCs for which NRC approval is required for construction.

D. Conclusions

Based on this preconstruction screening evaluation, the following conclusions are reached:

- The CFRW installation is an aid to construction and is a site preparation activity under 10 CFR 50.10(a)(2)(iii);
- While the CFRW are permanent site features, these walls have no permanent facility function;
- The CFRW installation is located beyond the excavation required for sufficient construction access to SSCs identified under 10 CFR 50.10(a)(1) and the CFRW have no adverse interactions with these SSCs, including influence on the stability analyses;
- The CFRW installation is unrelated to SSCs for which NRC approval is required for construction and has no reasonable nexus to radiological health and safety or common defense and security;
- The CFRW installation is not within the definition of construction activities under 10 CFR 50.10(a)(1).

The term "permanent retaining walls within an excavation" is used to describe the scope of construction activities for which prior NRC approval is required under 10 CFR 50.10(c) or (d). The CFRW are structures which are not "for" the SSCs which require prior NRC approval, and are not within the excavation required for sufficient construction access to these SSCs. Additionally, the CFRW will not create any adverse effect on any SSCs as defined in 10 CFR 50.10(a)(1) when installed or abandoned in place. In that the CFRW are neither retaining walls in the context of 10 CFR 50.10(a)(1) or (d) nor related to or supporting such SSCs, the CFRW installation activity does not constitute construction under this paragraph. Therefore, CFRW installation is a preconstruction activity and does not require prior NRC approval.

F. References

1. Limited Work Authorization Final Rule with Statements of Consideration, October 9, 2007 (72 FR 57415).
2. STPNOC letter, Mark A. McBurnett to Document Control Desk, "Submittal of Combined License Application Revision 3," dated September 16, 2009, U7-C-STP-NRC-090130, ML092930393.

Figure 1a. Overall Excavation Plan (From FSAR Figure 2.5S.4-48)

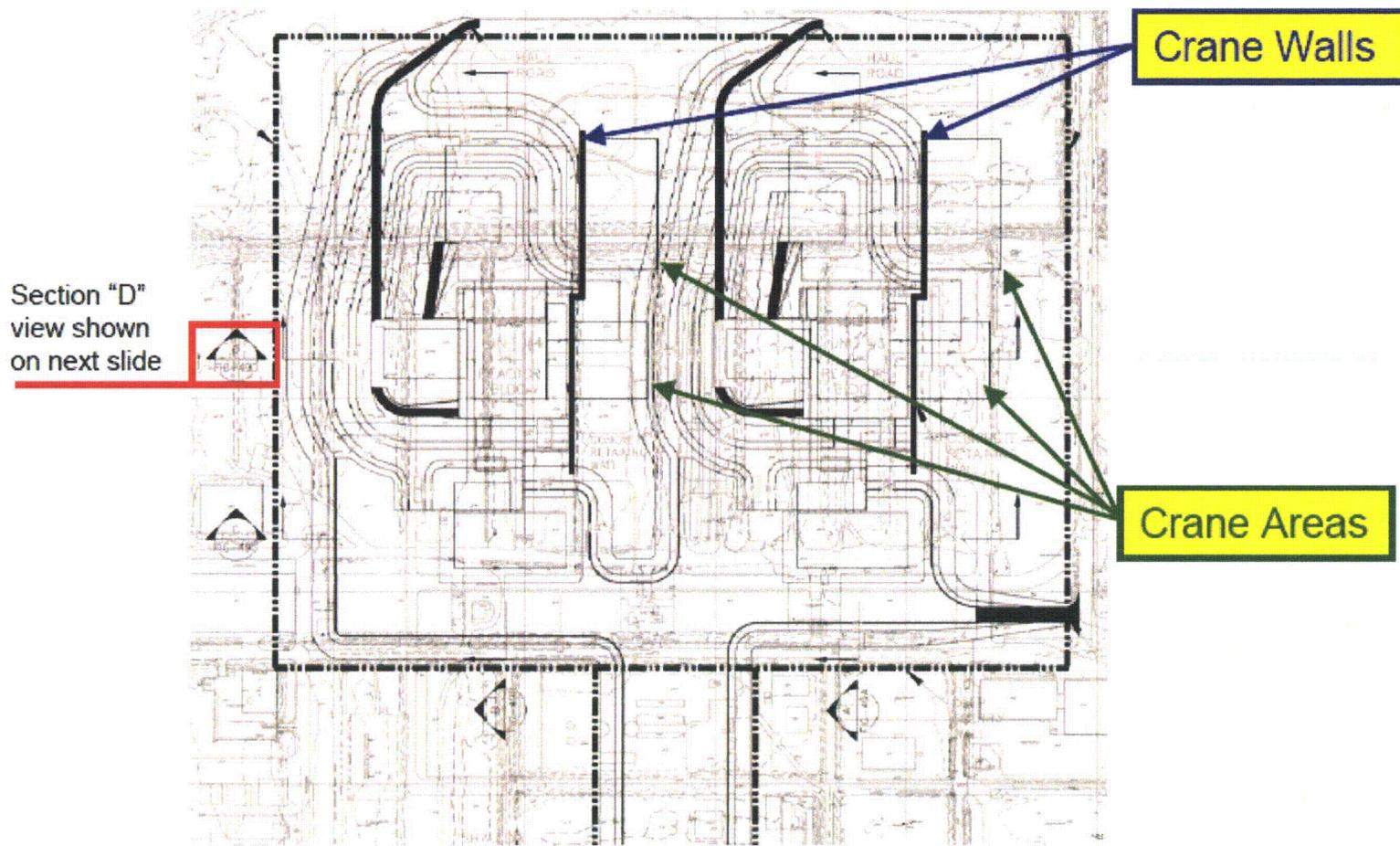
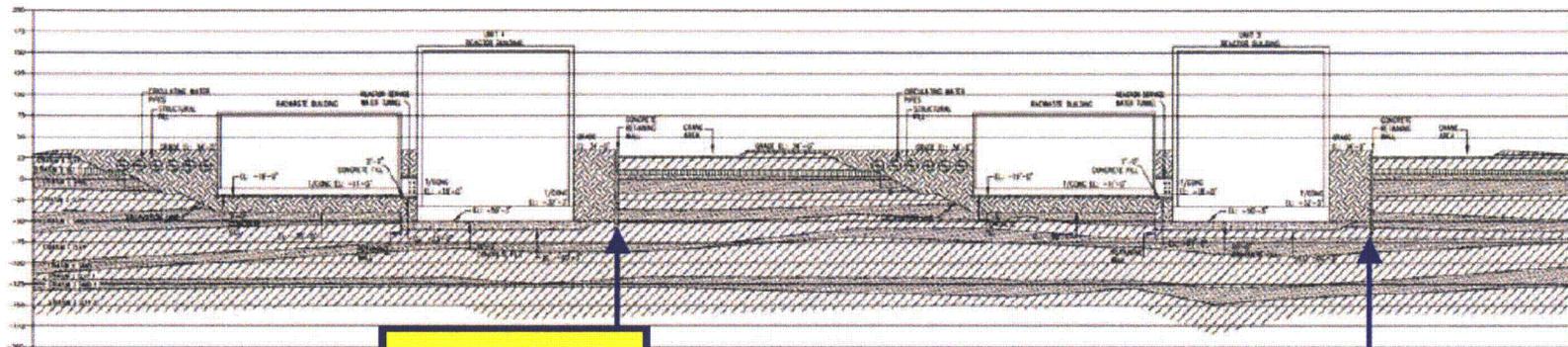


Figure 1b. Cutaway View (From FSAR Figure 2.5S.4-49D Section "D")



Crane Wall

Crane Wall

From South of the Reactor Buildings looking North

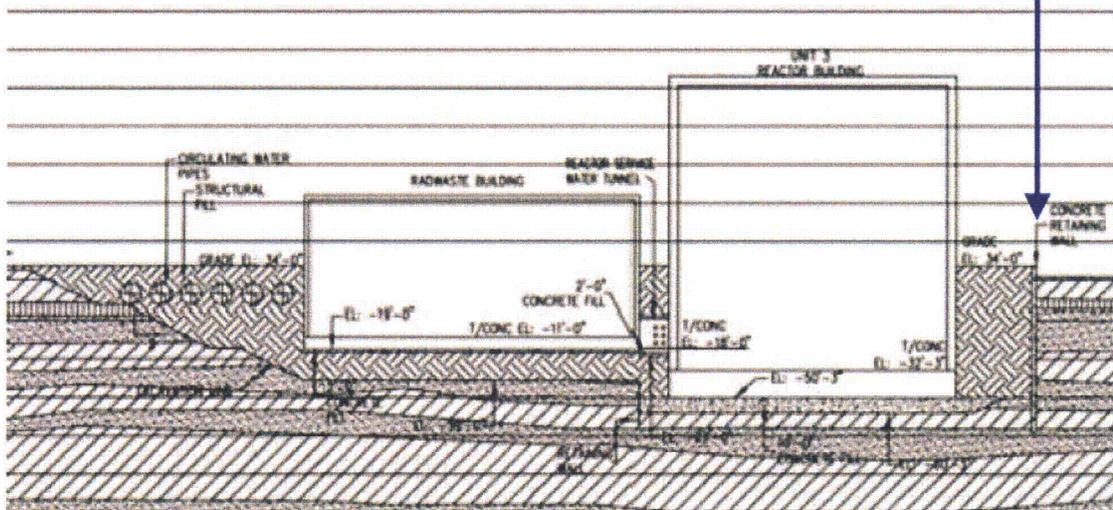


Figure 2a. Reinforced Concrete Retaining Wall for Crane Foundation

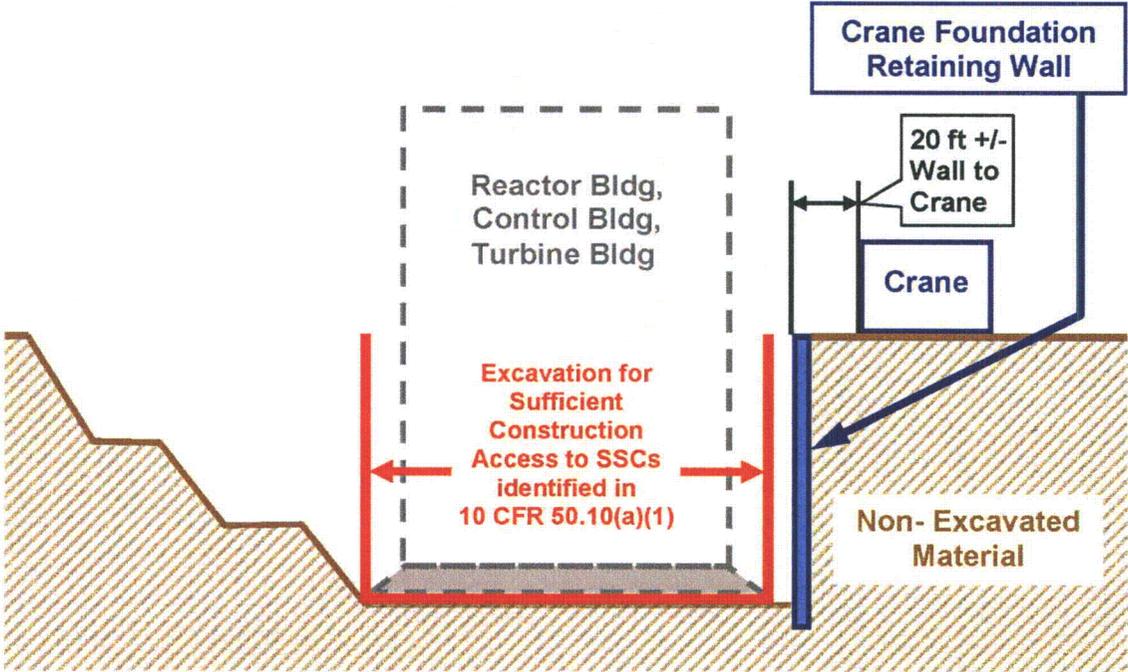
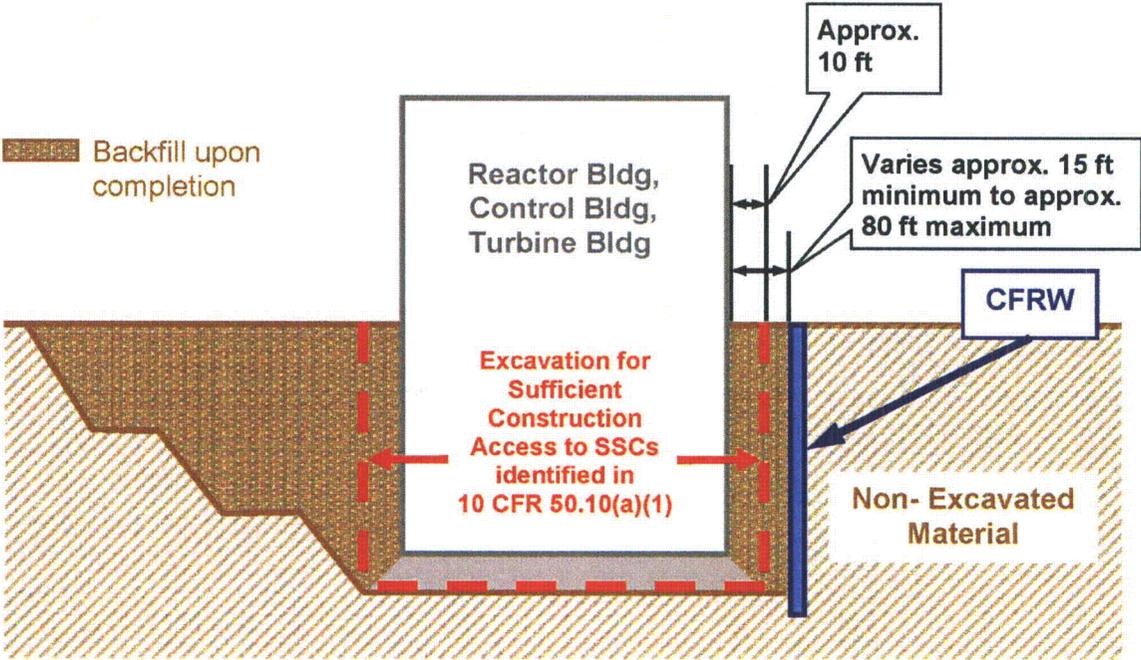


Figure 2b. Relationship of Excavation and Backfill to CFRW



Attachment 2

Crane Foundation Retaining Wall Evaluation Summary

Crane Foundation Retaining Wall Evaluation Summary

A. Purpose and Scope

1. Purpose

The purpose of this evaluation is to show that the construction Crane Foundation Retaining Wall (CFRW) installation has no adverse interactions with SSCs as identified by 10 CFR 50.10(a)(1)(i) through (vii), including influence on the stability (static and dynamic) analyses.

2. Scope of Evaluation

To assess the potential for adverse interactions with SSCs as identified by 10 CFR 50.10(a)(1)(i) through (vii), the scope of this evaluation includes:

- a. Soil-structure interaction analysis
- b. Static and dynamic bearing capacity and settlement

The appropriate elements of the STPNOC Quality Assurance Program Document (QAPD) for design and construction would be applied to the evaluation described below.

3. Structures Evaluated

SSCs as identified by 10 CFR 50.10(a)(1)(i) through (vii) with potential influence from the CFRW installation, i.e., the structures included in the evaluation, are:

- a. Reactor Building
- b. Control Building
- c. Ultimate Heat Sink and Reactor Service Water Pump House
- d. Turbine Building
- e. Service Building
- f. Diesel Fuel Oil Storage Vault and Trench
- g. Reactor Service Water Piping Tunnel
- h. Fire Protection Pump House

B. Evaluation and Results

NOTE: Distances, where provided below, are approximated.

1. Soil-structure interaction (SSI) analysis

The CFRW occupies a very small volume relative to the overall soil mass and represents a small increase in overall weight as compared to the replaced soil (150 pcf concrete

density versus soil densities of 125 to 130 pcf). As expected, it has a negligible effect on other nearby structures.

In order to confirm this expectation, an SSI analysis of the Reactor and Control Buildings was performed for the site-specific conditions, including site-specific Safe Shutdown Earthquake (SSE) and soil properties. This analysis was performed using two-dimensional (2D) models. For these 2D analyses, 2D models of the Reactor and Control Buildings were developed, and SSI analyses were performed using computer program SASSI2000, described in Final Safety Analysis Report (FSAR) Appendix 3C.8. These analyses used the same methodology, soil properties, and input motions as described in detail in FSAR Appendix 3A, Sections 3A.12 through 3A.21, except that a 2D model was used instead of a 3D model. The use of a 2D model was necessary since both the buildings and the CFRW could not be modeled in a 3D model which would be of a manageable size. The CFRW was modeled with the Reactor Building and Control Building in separate analyses, and the SSI analyses were repeated to evaluate the influence of the CFRW on the seismic response of the Reactor and Control Buildings.

a. Reactor Building

The CFRW is located 15 feet from the exterior wall of the Reactor Building (R/B). The comparison of the SSI analysis results, with and without the CFRW, are presented in Figures 2.1 through 2.4 for the R/B in-structure response spectra at four locations: bottom of basemat, reactor pressure vessel/main steam (RPV/MS) nozzle, top of the reinforced concrete containment vessel (RCCV), and top of the R/B. Table 2.1 compares maximum forces and moments, at key locations, with and without the CFRW. It can be seen from these figures and table that the CFRW does not have a significant effect on the responses of the R/B.

Figure 2.5 shows a comparison of the lateral soil pressure obtained from the SSI analysis on the R/B walls, with and without the CFRW. As expected, the lateral soil pressures are increased due to the presence of the CFRW. However, the R/B exterior walls are designed for the larger of the: (1) pressures provided in the Advanced Boiling Water Reactor Design Control Document (DCD) Tier 2 Figure 3H.1-11 and (2) pressures obtained from the alternate method described in FSAR Reference 2.5S.4-62 (see FSAR Section 2.5S.4.10.5.2). Both of these methods yield lateral pressures substantially higher than those obtained from the SSI analysis, as shown in Figure 2.5. Therefore, the increase in pressure due to the CFRW in the SSI analysis is of no consequence to the design of the exterior walls.

b. Control Building

The CFRW is located 80 feet from the exterior wall of the Control Building (C/B). The SSI analysis described above for the R/B and CFRW was also performed for the C/B and the CFRW. The distance separating the C/B from the CFRW used in the

analysis was conservatively based on 67 feet. Comparison of the in-structure response spectra for the C/B at the top of the basemat and the top of the C/B is shown in Figures 2.6 and 2.7, and the comparison of maximum seismic forces and moments is shown in Table 2.2. It can be seen from these figures and table that the CFRW does not have a significant effect on the responses of the C/B.

The evaluation and conclusion for lateral soil pressure for the C/B is the same as described for the R/B in paragraph B.1.a above.

c. Ultimate Heat Sink and Reactor Service Water Pump House

The Ultimate Heat Sink (UHS) and Reactor Service Water Pump House (RSWPH) is a large structure. Its smallest separation distance from the CFRW is nearly 60 feet. The dynamic response of a relatively large structure (UHS and RSWPH) at a significant distance from a relatively small structure (CFRW) would not be influenced by the presence of the small structure. Based upon the results of the R/B and C/B SSI analyses, it can be concluded that the CFRW does not have a significant effect on the response of the UHS and RSWPH.

d. Turbine Building

The CFRW is located 15 feet from the exterior wall of the Turbine Building (T/B). The T/B is a large structure. The influence of the CFRW, a much smaller structure, on the T/B is expected to be insignificant. Based upon the results of the R/B SSI analyses, it can be concluded that the CFRW does not have a significant effect on the response of the T/B.

e. Service Building

The Service Building (S/B) is a non-Seismic Category I structure (refer to FSAR Section 3.2, Table 3.2-1) designed for the SSE, meeting Seismic Category II/I requirements. The SSE input for this II/I evaluation is determined based on the influence of a heavy structure (i.e., C/B) on the lighter nearby structure (S/B). The influence of the C/B on the SSE input and design of the S/B far exceeds any influence from the much lighter CFRW. Therefore, the presence of the CFRW has no influence on the S/B design.

f. Diesel Fuel Oil Storage Vault and Trench

The Diesel Fuel Oil Storage Vault and Trench are designed for the SSE input considering the influence of a heavy structure (i.e., R/B) on the lighter nearby structure (Diesel Fuel Oil Storage Vault and Trench). The influence of the R/B on the SSE input and design of the Diesel Fuel Oil Storage Vault and Trench far exceeds any influence from the much lighter CFRW. Therefore, the presence of the CFRW has no influence on the design of the Diesel Fuel Oil Storage Vault and Trench.

g. Reactor Service Water (RSW) Piping Tunnel

The RSW Piping Tunnel is located more than 250 feet away from the CFRW. At this location, the CFRW has no effect on the RSW Piping Tunnel.

h. Fire Protection Pump House

The Fire Protection Pump House is located more than 300 feet away from the CFRW. At this location, the CFRW has no effect on the Fire Protection Pump House.

2. Static and Dynamic Bearing Capacity and Settlement

A qualitative engineering assessment was performed to determine if the preconstruction activity of installing the CFRW results in adverse interactions with the static and dynamic stability (bearing capacity and settlement) of the structures listed in Section A.3 above. The 3-foot wide concrete CFRW is needed to provide support for cranes that will be used during construction of Units 3 & 4. The CFRW is generally located on the east side of each unit. The closest separation from the CFRW and the near edge of a structure wall foundation (specifically a Diesel Fuel Oil Storage Vault) is 15 feet to the structure wall and 11 feet to the edge of the foundation. The Diesel Fuel Oil Storage Vaults are supported on 44 feet of structural fill placed as backfill for the Units 3 & 4 excavation. The S/B will be located across the CFRW, supported on 45 feet of backfill west of the CFRW and on undisturbed soil on the east side. The S/B will be separated by 3 feet of soil from the top of the CFRW and 15 feet horizontally from the CFRW. Thus, the CFRW does not support the S/B foundation.

The qualitative analysis of the R/B was performed as the worst case scenario due to its proximity to the CFRW and because the bulk of the structural fill within the nuclear island would not be in place at the time of its construction. The bottom of the CFRW at elevation minus 80 feet is 30 feet below the foundation level elevation (minus 50 feet) of the R/B. The R/B foundation is underlain by 10 feet of concrete fill (extending at a roughly 45 degree angle outward to elevation approximately minus 60 feet) whose edge is then 5 feet from the CFRW.

a. Bearing Capacity

From qualitative considerations, the results of existing analyses (refer to FSAR Section 2.5S.4.10.3) indicate that the conclusion that the ultimate static bearing capacity will exceed the applied soil bearing pressure by an adequate factor of safety of three remains valid.

The dynamic bearing capacity is of interest after construction is complete and fuel is loaded. The CFRW does not impact the dynamic bearing capacity after construction since the space between the safety-related and non-safety related structures and the CFRW has been backfilled and the soil behind the CFRW will be in a natural state.

Therefore, there is no adverse impact to safety-related and non-safety related structures.

b. Settlement

The qualitative assessment for the settlement considered: (1) the change in settlement caused by the change in area (configuration) of the structural fill zones surrounding the R/B; (2) the impact to settlement due to adhesion created between the structural fill and the CFRW; and (3) the impact of adhesion on soil rebound. From qualitative considerations, the CFRW will affect the settlement of the R/B foundation in the following ways:

- The bottom elevation of the CFRW, at 15 feet horizontally from and 30 feet deeper than the R/B foundation, encroaches on the 1:1 (horizontal: vertical) line usually used to assign relative depth between adjacent foundations to avoid stress overlap. This encroachment will interfere with (reduce) the dissipation of stress laterally away from the foundation, which will slightly increase settlement of the R/B foundation along the side nearest to the CFRW.
- Settlement of soil relative to the CFRW will be partially reduced by adhesion of the soil to the wall, and will slightly reduce the settlement of the R/B foundation.
- The weight of the retained soil mass will cause the stresses remaining in the soil beneath the R/B foundation at the completion of the excavation to be greater than if the entire area was excavated as was assumed in the existing settlement calculations (results presented in FSAR Section 2.5S.4.10.4). This will reduce the soil rebound of the reactor foundation subgrade in the vicinity. A reduction of soil rebound is generally considered a positive impact to the foundation.

The net effect of the qualitative assessment is that the total settlement of the R/B increases slightly at the east side of the structure due to the change in the configuration of the structural backfill zones as a result of the presence of the CFRW. However, this slight increase is offset due to the reduction in settlement caused by the adhesion between the soil and the CFRW. The results of the qualitative considerations indicate that there is generally little difference to the overall previously calculated total settlement (see FSAR Section 2.5S.4.10.4).

The qualitative assessment also indicates that the slight increase in settlement at the east side due to the presence of the CFRW has a beneficial effect on the angular distortion across the R/B. The amount of maximum angular distortion decreases across the structure from the previously calculated value of 1/600 (refer to FSAR Section 2.5S.4.10.4) to approximately 1/625 in the current qualitative analysis.

The CFRW is located between the loaded crane pad and the nuclear safety-related structures. The CFRW will act as a barrier between the crane pad and the structures

so that there is little increase in effective stress and influence on the structures from crane operations.

The majority of the structures will be constructed farther away from the CFRW than the distance of the CFRW from the R/B. In addition, installation of the CFRW and a majority of the backfill should be completed prior to the construction of these other structures; therefore, the above-described qualitative assessment shows that the presence of the CFRW does not adversely influence the static and dynamic stability of the structures.

C. Conclusion

The evaluations discussed above demonstrate that the CFRW has no adverse interaction with SSCs as identified in 10 CFR 50.10(a)(1), including influence on the stability (static and dynamic) analyses.

Table 2.1
Reactor Building Force Comparison

Effect Of Crane Wall on Maximum Forces, Mean Soil				
Beam Element	Location	Response Type	Model in SASSI Analysis	
			2-D Reactor Building (alone)	2-D Reactor Building + CFRW
28	Shroud Support	Shear	119	119
		Moment	2,494	2,492
69	RPV Skirt	Shear	371	372
		Moment	6,490	6,433
78	RSW Base	Shear	313	315
		Moment	4,750	4,752
86	Pedestal Base	Shear	1,815	1,825
		Moment	110,857	111,627
89	RCCV at Grade	Shear	5,704	5,729
		Moment	286,375	289,930
99	R/B at Grade	Shear	13,851	13,951
		Moment	1,057,415	1,064,920

Units: Shear in kip; Moment in kip-ft

Table 2.2
Control Building Force Comparison

Effect of Crane Wall on Maximum Forces, Mean Soil				
Beam Element	Location	Response Type	Model in SASSI Analysis	
			2-D Control Building (alone)	2-D Control Building + CFRW
6	C/B at Grade	Shear	3,829	3,892
		Moment	144,908	145,381

Units: Shear in kip; Moment in kip-ft

Figure 2.1: Comparison of Response Spectra, Reactor Building, Bottom of Basemat

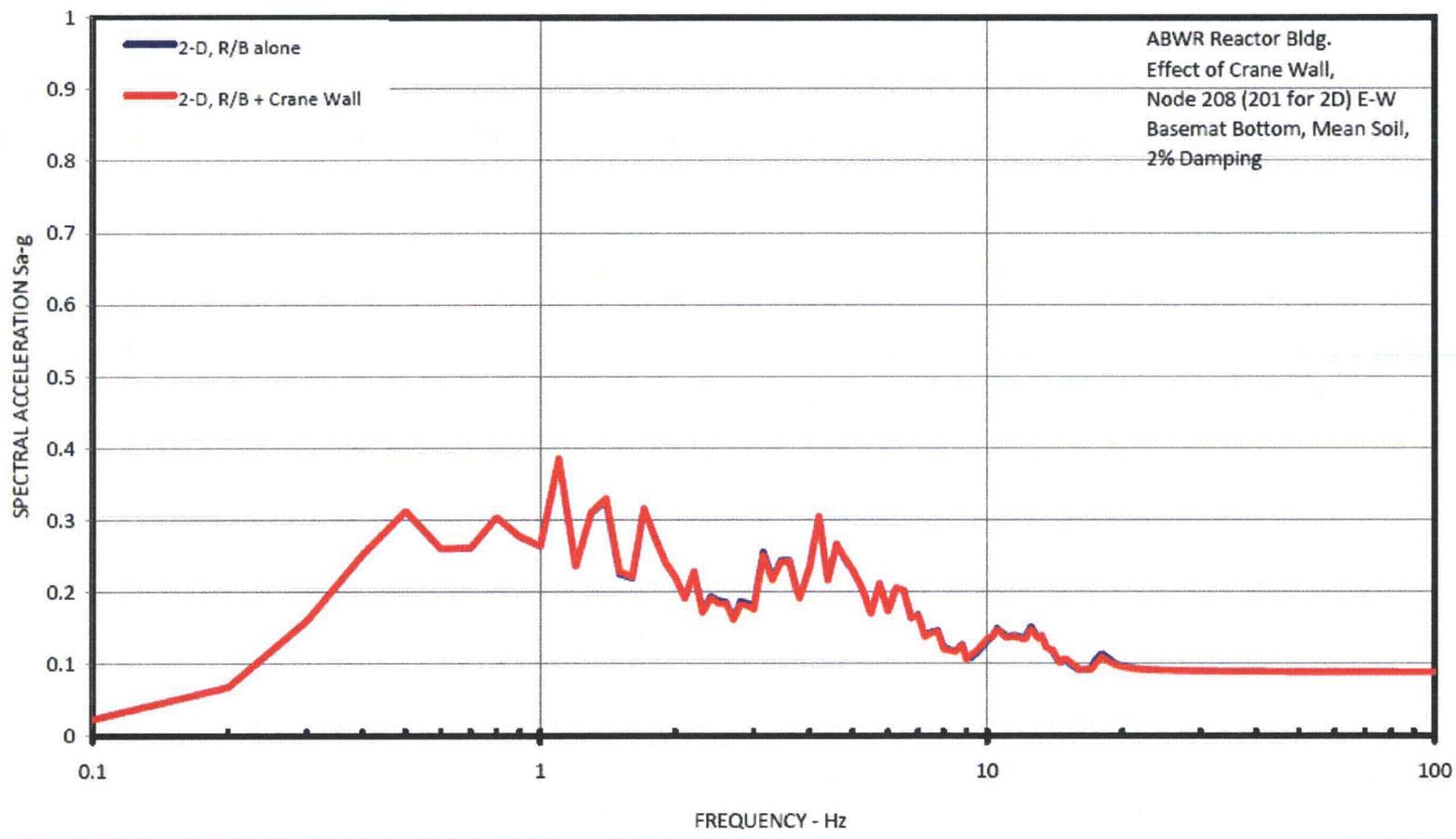


Figure 2.2: Comparison of Response Spectra, Reactor Building, RPV/MS Nozzle

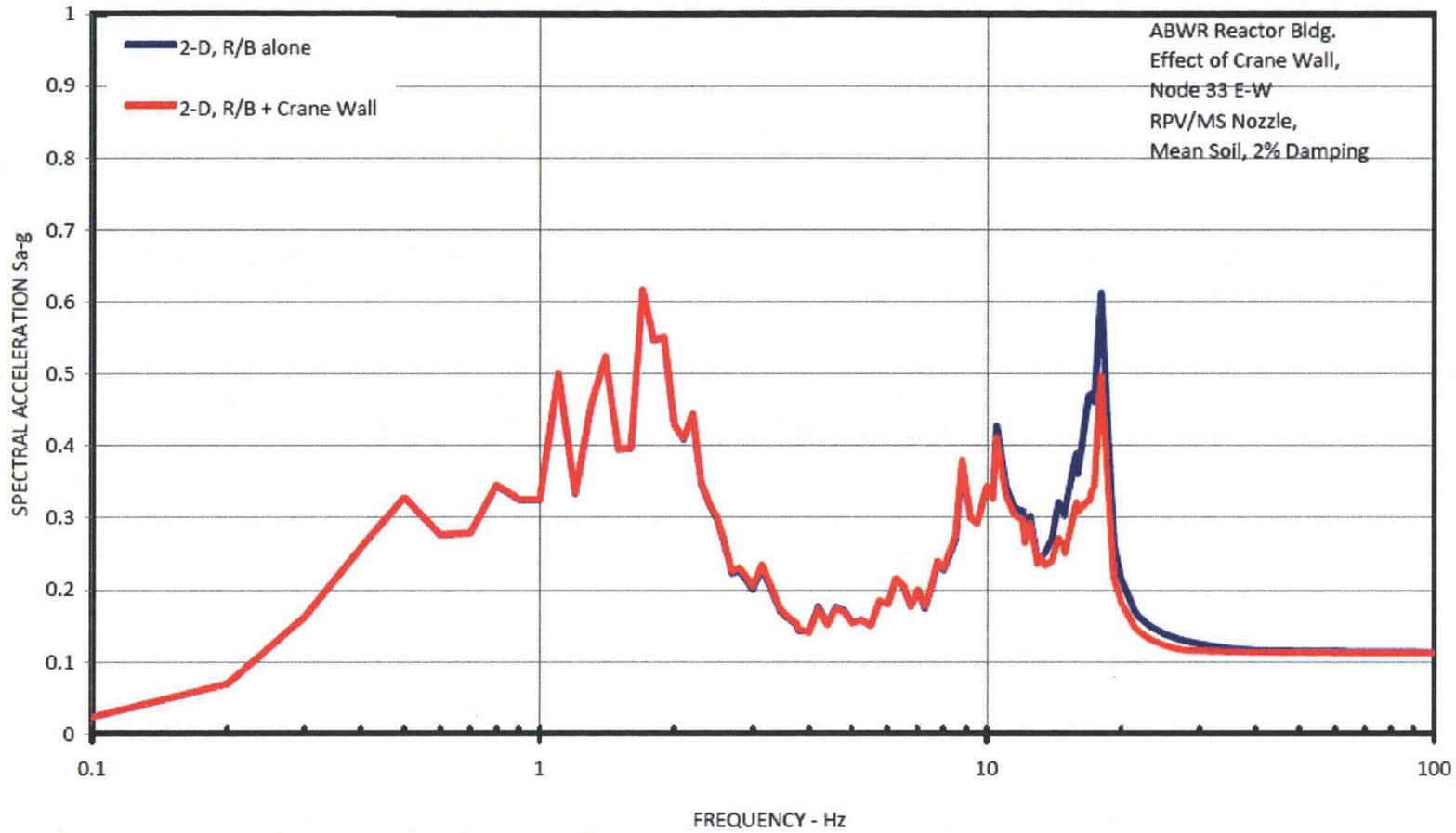


Figure 2.3: Comparison of Response Spectra, Reactor Building, Top of RCCV

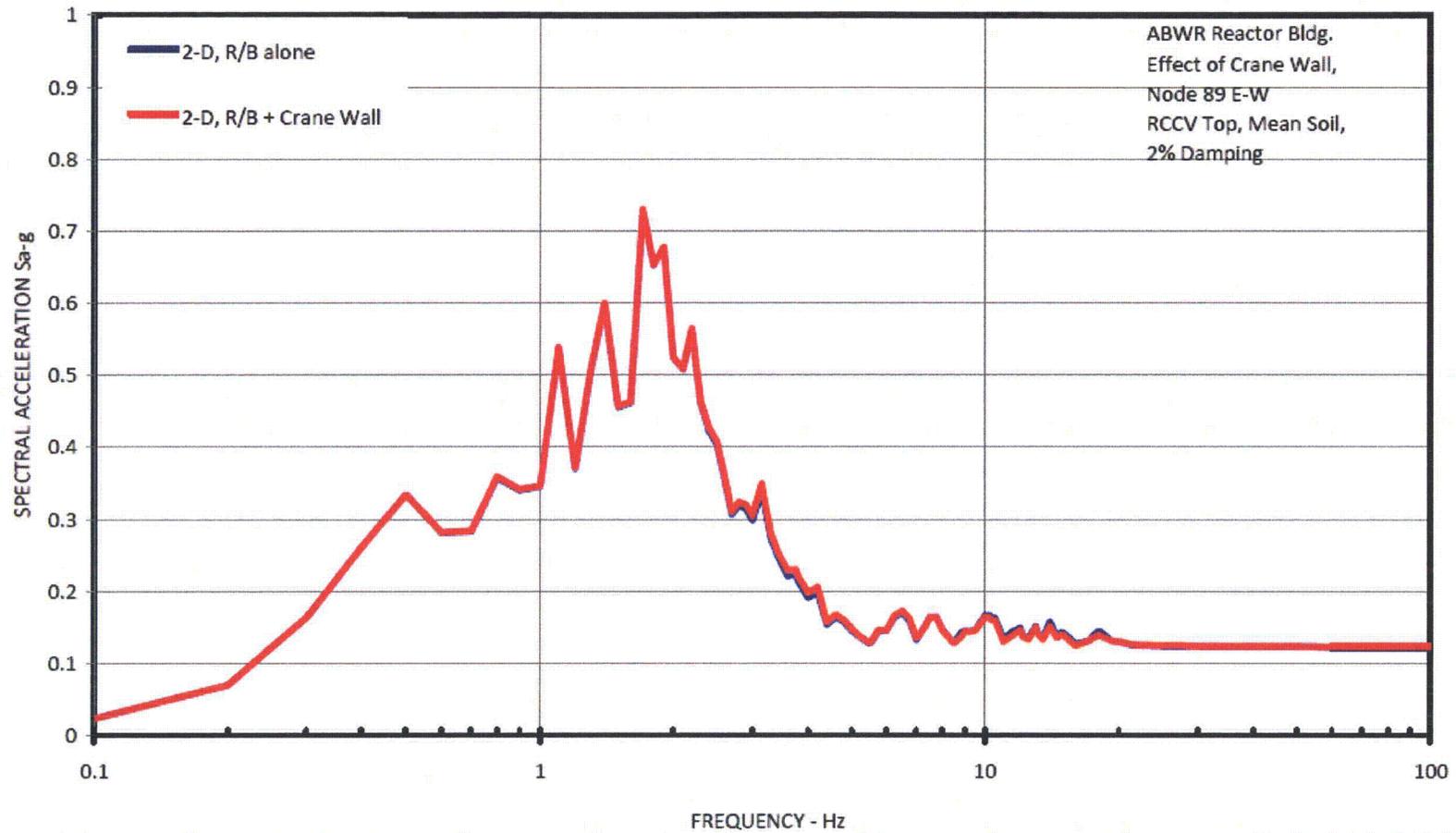


Figure 2.4: Comparison of Response Spectra, Top of Reactor Building

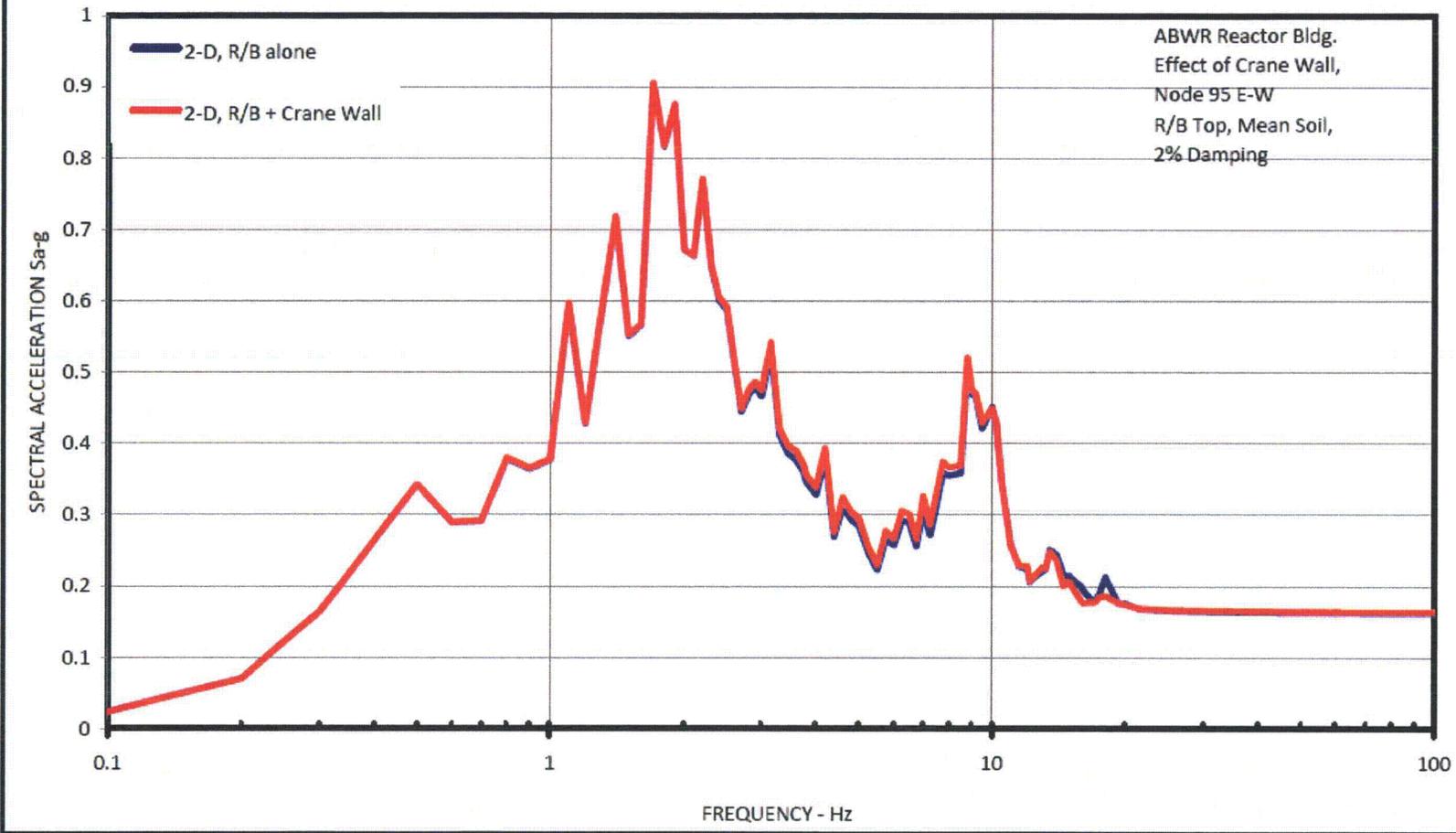


Figure 2.5:

Reactor Building Site Specific
At-Rest Seismic Lateral Earth Pressure (psf)
Multiple Methods Displayed

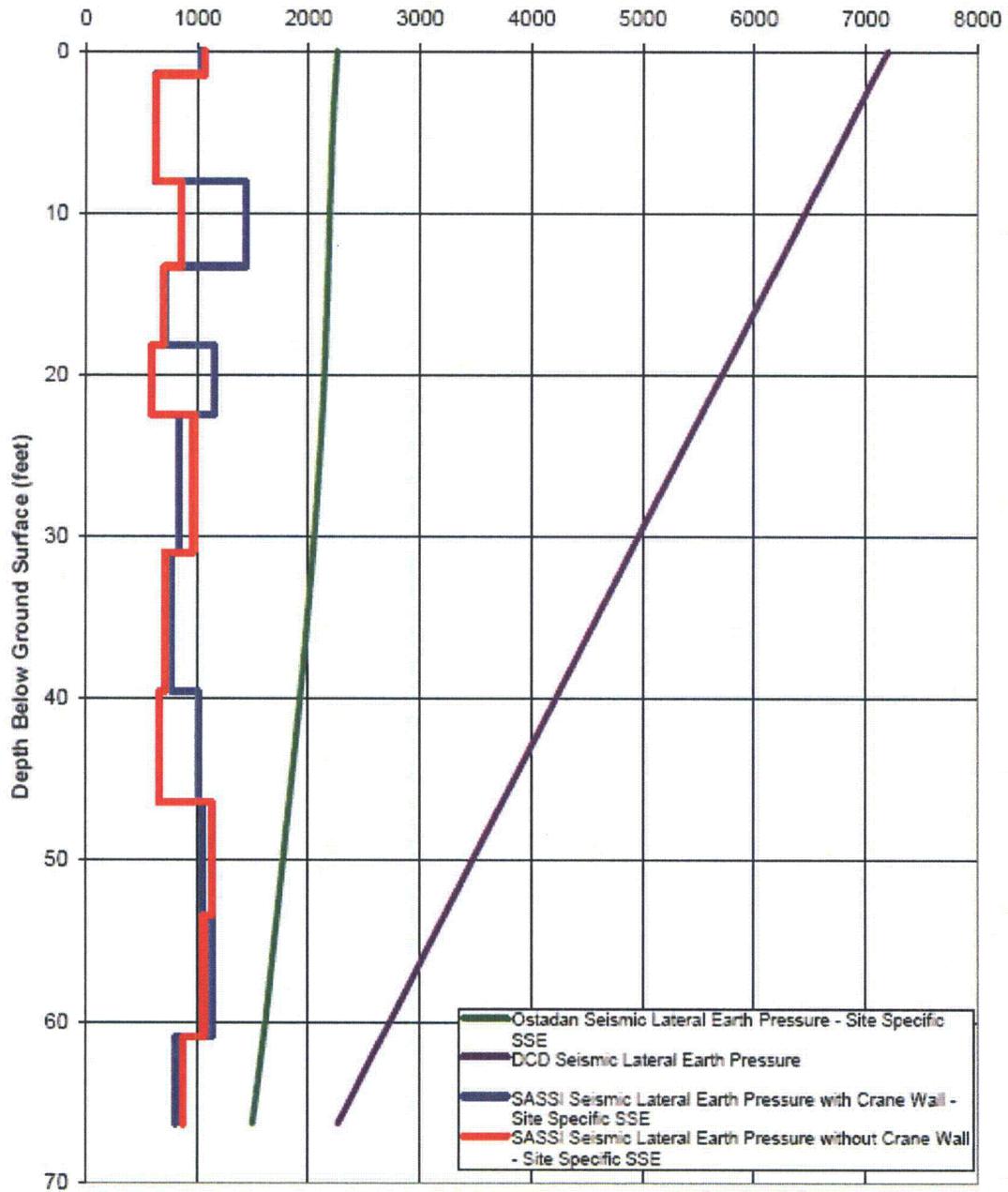


Figure 2.6: Comparison of Response Spectra, Control Building, Top of Basemat

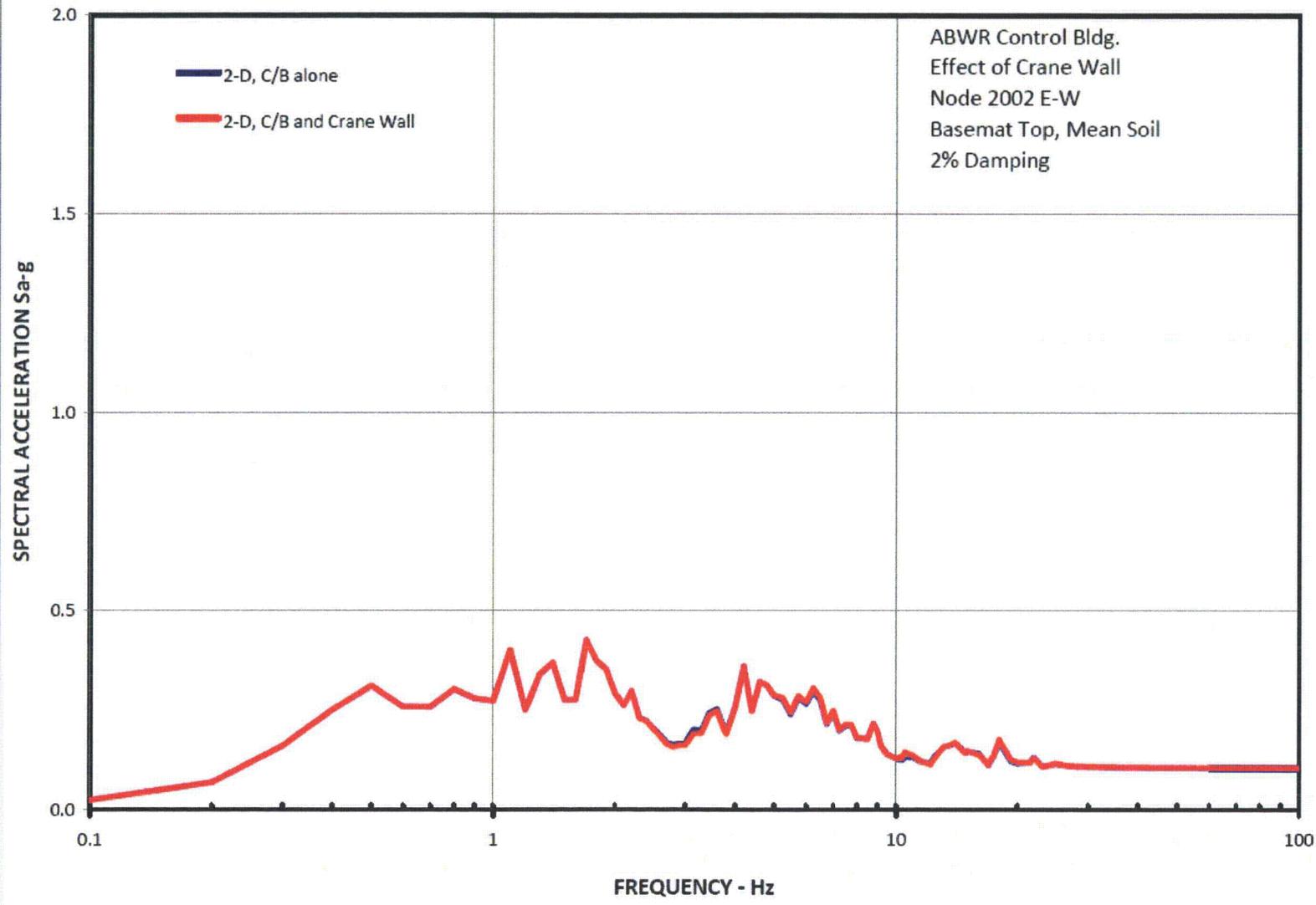
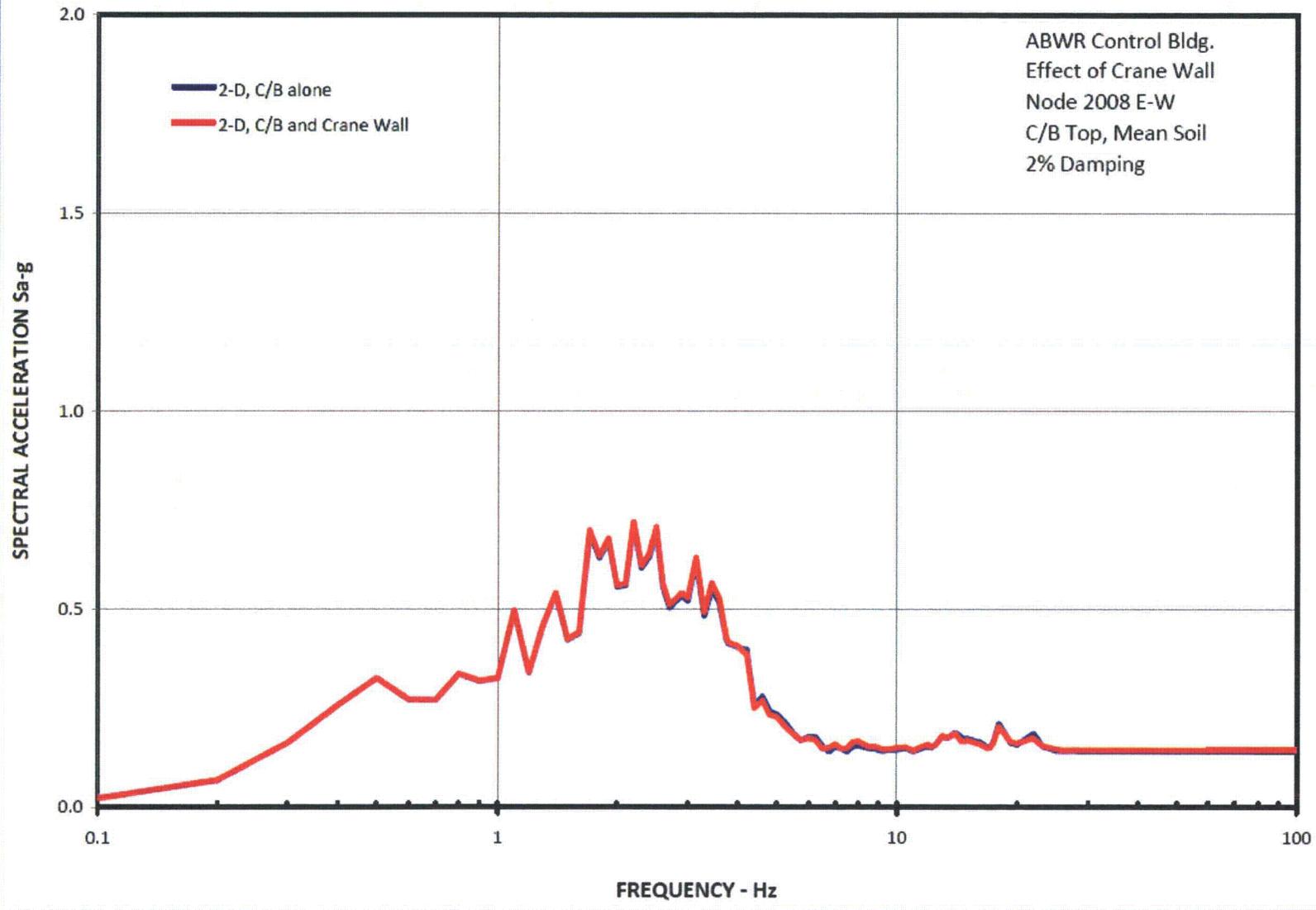


Figure 2.7: Comparison of Response Spectra, Top of Control Building



Attachment 3

Request for Limited Work Authorization for the Crane Foundation Retaining Wall Installation

Request for Limited Work Authorization for the Crane Foundation Retaining Wall Installation

A. Background

STP Nuclear Operating Company (STPNOC) is submitting this Limited Work Authorization (LWA) request contingent upon the Nuclear Regulatory Commission (NRC) review of Attachment 1 and Attachment 2 to this letter, and the subsequent determination that an LWA is required pursuant to 10 Code of Federal Regulations (CFR) 50.10.

As discussed in the transmittal letter, this LWA request is being submitted in two parts. This attachment provides the first part of the LWA request, which includes the information required by 10 CFR 50.10(d)(3)(i). The second part of the LWA request will consist of the information required by 10 CFR 50.10(d)(3)(ii) and (iii). STPNOC will promptly submit the second part of the LWA request if the NRC provides notice during the acceptance review that the CFRW installation requires prior approval.

B. Introduction and Purpose

Introduction

The NRC's LWA process in 10 CFR 50.10 allows Combined License (COL) applicants to perform preconstruction activities without prior NRC approval. However, construction activities, as defined in 10 CFR 50.10(a)(1)(i) through (vii), require prior NRC approval. The rule allows the applicant to submit an LWA request in addition to the underlying Combined License Application (COLA).

Purpose

STPNOC requests this LWA as part of the COLA, submitted on September 20, 2007, and in accordance with 10 CFR 50.10(d), "Request for limited work authorization." This LWA request is limited to the installation of the Crane Foundation Retaining Walls (CFRW), i.e., one retaining wall per unit for a total of two walls.

Safety Analysis Report

Pursuant to the requirements of 10 CFR 50.10(d)(3)(i), STPNOC is providing the following safety analysis report:

1. The final design for any foundations or other work being requested under the LWA:

This LWA request is limited to the installation of the CFRW. The location of the CFRW is designed to accommodate the crane function and required location to facilitate modular construction techniques. The retaining wall design is described in the Final Safety Analysis Report (FSAR) Section 2.5S.4.5.2.4.

2. The final design for any structures that would be supported by the foundation or other work being requested under the LWA:

There are no structures within the scope of 10 CFR 50.10(a)(1) that would be supported by the CFRW foundation.

3. Safety analysis for any foundation or other work being requested under the LWA:

This LWA request is limited to the installation of the CFRW. As discussed in FSAR Section 2.5S.4.5.2.4, the CFRW are non-safety related. The CFRW would be abandoned in place following plant construction and have no permanent facility function.

Attachment 2 provides the safety analysis for the CFRW installation activity and evaluates SSCs, as defined by 10 CFR 50.10(a)(1), with potential for influence from the CFRW installation. These SSCs include, but are not limited to, the Reactor Building, the Control Building, the Turbine Building, and the Service Building. Attachment 2 concludes that the CFRW have no adverse interaction with these SSCs, including influence on the stability (static and dynamic) analyses.

4. Any relevant safety analysis for structures that would be supported by the foundation or other work being requested under the LWA, e.g., stability (static and dynamic) analyses:

There are no structures within the scope of 10 CFR 50.10(a)(1) that would be supported by the CFRW foundation; therefore, additional safety analyses are not required.

Table 1 below lists the sections of the FSAR (Reference 2) that are applicable to this LWA request.

The CFRW installation would be conducted in compliance with the STPNOC Quality Assurance Program Description (QAPD) as described in FSAR Section 17.5S. The appropriate elements of the STPNOC QAPD for design and construction are applied to the safety analyses described in Attachment 2.

C. Description of LWA Activities

This LWA request is limited to the installation of the CFRW. This includes installation of reinforced concrete retaining walls near the east edge of the excavation area for the Reactor Building, Control Building, and Turbine Building for each unit. Descriptions of the CFRW and installation activities are included in FSAR Sections 2.5S.4.5.2.4 and 2.5S.4.5.4.4.

D. Proposed ITAAC

As discussed above, the CFRW are non-safety related and have no permanent plant function. Furthermore, the analysis in Attachment 2 demonstrates that the CFRW installation has no significant influence on SSCs as defined by 10 CFR 50.10(a)(1). Therefore, no additional ITAAC are required for the CFRW.

E. Environmental Report

The second part of the LWA request will provide the environmental report, as required by 10 CFR 50.10(d)(3)(ii). STPNOC will promptly submit the second part of the LWA request if, during the acceptance review, the NRC provides notice that the CFRW installation requires prior approval.

F. Site Redress Plan

The second part of the LWA request will provide the site redress plan, as required by 10 CFR 50.10(d)(3)(iii). STPNOC will promptly submit the second part of the LWA request if, during the acceptance review, the NRC provides notice that the CFRW installation requires prior approval.

G. Technical qualifications of the applicant to engage in the proposed activities

This request for an LWA is based on the technical qualifications of STPNOC and the Engineering, Procurement, and Construction (EPC) team described in FSAR Section 1.4. General information about the COL applicant, as required by 10 CFR 50.33, is addressed in COLA Part 1.

H. References

1. Limited Work Authorization Final Rule with Statements of Consideration, October 9, 2007 (72 FR 57416)
2. STPNOC letter, Mark A. McBurnett to Document Control Desk, "Submittal of Combined License Application Revision 3" (U7-C-STP-NRC-090130), September 16, 2009

Table 1: FSAR Sections Applicable to LWA Request

Item	FSAR Section	Reference	Summary of LWA Applicability
1	1.4	Attachment 3, Section G	Provides technical qualifications of applicant.
2	2.5S.4.10.5.2	Attachment 2, Section B.1.a	Provides alternate method for lateral soil pressure calculation.
3	2.5S.4.5.2.4	Attachment 3, Section C	Provides site specific properties of the crane foundation retaining walls.
4	2.5S.4.5.4.4	Attachment 3, Section C	Provides for the installation of the reinforced concrete retaining walls utilizing a slurry trench method of construction.
5	2.5S.4.10.3	Attachment 2, Section B.2.a	Provides for the estimation of Static bearing capacity of foundations due to applied loads to assess stability.
6	2.5S.4.10.4	Attachment 2, Section B.2.b	Provides for the estimation of building foundation settlements due to applied loads to assess stability.
7	Appendix 3A, Sections 3.A.12 through 3.A.21	Attachment 2, Section B.1	Provides modeling and input used in SSI.
8	Appendix 3C, Section 3C.8	Attachment 2, Section B.1	Provides description of the computer program SASSI2000.
9	Appendix 3H, Figure 3H.1-11	Attachment 2, Section B.1.a	Provides lateral soil pressures on the Reactor Building.
10	3.2, Table 3.2-1	Attachment 2, Section B.1.e	Provides the seismic classification of the Service Building.
11	17.5S	Attachment 2, Section A.2 Attachment 3, Section C	Provides the STPNOC QAPD.