

**APR1400**  
**Feedback on Response to RAI 208-8245, Question 03.08.03-3, Rev. 1**  
**Prepared September 16, 2016**

The applicant is requested to address the remaining items listed below.

1. Page 2/2 of the response states:

“Based on the ACI 349 Appendix C, impactive and impulsive effects are treated separately because of the nature of the effects as well as the response characteristics of the structural members subjected to these loads. Yj and Ym act on the local area of the internal structures. So, Yj and Ym are evaluated with the design margin of the arranged reinforcement in the local area after design with load combinations.”

This statement suggests that Yj and Ym are evaluated separately, i.e., without the other loads in the Abnormal/Extreme Environmental load combination. Provide the technical basis for this since:

(1) The quoted statement from ACI 349 Appendix C means the effects are evaluated separately, not the effects are evaluated in a separate load combination without other loads. This is evident from the ACI 349 Appendix C statement in the same paragraph which states: “Nuclear safety related concrete structures shall be designed for impulsive and impactive loads using this code and the special provisions of this appendix. These loads must be combined with other loads in accordance with 9.1 of this Code and in accordance with requirements of C.8 of this Appendix.”

(2) ACI 349, Section 9.2, for the Abnormal/Extreme Environmental load combination, combines Yj and Ym, as well as Yr (not mentioned above) with dead load, prestress load, live load, etc.

2. Page 2/2 of the response states:

“There are no Ro and Ra at the primary shield wall (PSW).” According to ACI 349, Ro is defined as piping and equipment reactions, or related internal moments and forces, which occur under normal operating and shutdown conditions, excluding dead load and earthquake reactions.” Ra is defined as “piping and equipment reactions, or related internal moments and forces, under thermal conditions generated by a postulated pipe break and including Ro.” Please confirm that there are no pipe supports or equipment that will be attached to the PSW and as well as the IRWST (which is indicated on page 8/12 of the response). Also, explain how this can be assured as the detailed design of piping and equipment progresses in the detailed design.

3. Page 4/12 of the response provides a markup for DCD Section 3.8.4.3.1.d which states:

“Pipe, cable tray, duct, and ties – (Ro)

This includes their dead load, live load, thermal load, seismic load, thrust load, and

unbalanced internal pressure under normal and severe environmental conditions.” Including the dead load and seismic load for these systems and components in  $R_o$  is inconsistent with ACI 349. The dead load for these systems and components should be in the overall dead load definition  $D$ , and the seismic load should be in the load  $E_s$  (safe shutdown earthquake). Also, the quote that these loads are “under normal and severe environmental conditions” does not cover all of the loading conditions, as shown in DCD Table 3.8-9A, and thus it is inconsistent with this table. Provide the basis for the above definition or revise it accordingly.

4. Page 5/12 of the response provides a markup for DCD Section 3.8.4.3.2.c which states:

“Accident reactions of pipe, cable tray, duct, and ties – ( $R_a$ )

$R_a$  is reactions of pipe, cable tray, duct, and ties. This includes their dead load, live load, thermal load, seismic load, thrust load, and transient unbalanced internal pressure loads under abnormal and/or extreme environmental conditions.”

Including the dead load, live load, thermal load, seismic load, thrust load, and transient unbalanced internal pressure loads for these systems and components in  $R_a$  is inconsistent with ACI 349. Also, the quote that these loads are “under normal and severe environmental conditions” does not cover all of the loading conditions, as shown in DCD Table 3.8-9A, and thus it is inconsistent with this table. Provide the basis for this definition or revise it accordingly.

5. Page 9/12 of the response for the IRWST, identifies several load combinations that include  $P_s$ .

For load combination a. - Normal load combination:

$P_s$  is used with no definition of this load. Identify where in DCD the load  $P_s$  is defined. In the RAI response to Question 03.08.01-1, the markup identifies this load as the combustible gas control inside containment. However, it is believed that for the containment internal structures the load  $P_s$  was not intended to be the combustible gas control, but perhaps the safety relief valve load (SRV). Define the  $P_s$  load and if it is not for combustible gas control then a different designation (other than  $P_s$ ) should be used to avoid confusion.

For load combination b. - Abnormal and d. - Abnormal/Extreme Environmental:

Explain why  $P_s$  is utilized instead of  $P_a$ .

For all of the load combinations a., b., c - Extreme Environmental, and d:

Explain why the SRV loading is not included. Also, the appropriate load factors for the SRV loading should be used and if different than the guidance in SRP 3.8.1 Appendix A, then provide the basis.