NRC Feedback on "KHNP's Draft Revised Response to RAI 227-8274, Question 3.8.4-3" (Draft Response Provide 3/23/16)

The staff evaluated the draft response to Question 3.8.4-3 and noted the following:

a. Still missing RGs in the response for various sections. See feedback from BNL on 2/2/16 which listed the missing RGs. Still missing RGs: 1.7 and 1.91 for DCD Section 3.8.1; 1.7 for DCD Section 3.8.2; 1.69 and 1.160 for DCD Section 3.8.3.

KHNP Input
For DCD Section 3.8.1, RG 1.7 is currently listed in DCD Tier 2, Subsections 3.8.1.2.2 and 3.8.7.
For DCD 3.8.3, RG 1.160 was added in the revised response to RAI 277-8274, Question 03.08.03-4-3 Rev.1.
The draft response will be revised to add RG 1.91 to DCD Subsection 3.8.1.2.2, RG 1.7 to DCD Subsection 3.8.2.2.2, and RG 1.69 to DCD Subsection 3.8.3.2.2.

b. Acceptable

c. Acceptable but Confirmatory

d. Acceptable but Confirmatory

e. The second sentence states that "… the philosophy of a metallic liner (interpreted to mean containment liner) anchored in concrete and functioning as a leaktight boundary is identical with the design approach for the stainless steel liner plate (interpreted to mean stainless steel liners in pools)." The original RAI question and follow up question focused, not on the design philosophy, but on the welding procedures. Explain whether the welding procedures between the applicable AWS standards (not being used) and ASME Section III, Division 2, Subsection CC are different, and if so, the basis for using the ASME welding procedures instead. [*Side Note to NRC: in the feedback (and the original questions) transmitted to KHNP, it was stated that the ASME Section III, Div. 2 Article CC-4540, is applicable for containment liner plates, which are carbon steel and not stainless steel, …" I believe that containment liner plates may be constructed from stainless steel too, usually used in wetted regions.*]

The third sentence states "Unlike containment liner plate, none of the stainless steel liner plates are designed as structural members." This statement should be explained because for containment design, liners are normally not designed as structural members. Also, DCD Section 3.8.1.4.10 states for the containment liner that "The liner plate is not assumed as a structural member in the design other than during construction. The statement in the RAI response indicates that it is considered as a structural member in the containment design.

The fourth sentence states "The stainless steel liner plate is not safety related structure or a pressure boundary." If the stainless steel liner plate is used in a safety-related pool structure, then explain why the liner is not safety-related.

The second paragraph states that “AWS D1.4 for welding reinforcing steel and AWS D1.8 for structural welding of seismic resistance systems is not used.” should be clarified regarding “what is not used.” Explain whether the two AWS standards are not used because welding of reinforcing steel and seismic resistance systems are not used, or simply the AWS standards are not used but welding of reinforcing steel and welding of seismic resistance systems may be used. If it is the former, then the DCD should clearly state that welding of reinforcing steel and welding of seismic resistance systems is not used in the design of the APR1400, and describe what alternate methods and standards are used. If it is the latter, then explain why these standards do not apply.

New Item: It was noted that in the current draft of the RAI response, some markups have been omitted from the prior RAI response (e.g., markups for Reference 41, Table 3.8-1, and Sections 3.8.4.6.1.2 and 3.8.4.6.1.3). To review drafts of RAI responses and for future submittals of RAI responses, they should include a complete set of information and all markups (current and prior) to avoid confusion and to facilitate the staff’s review. [*Need to discuss with NRC staff to confirm this request is OK*]

KHNP Input

There are differences in the variables requirements between the two codes. The basic approach used by the ASME Section III, Division 2 regarding the Welding Code is identical to provide the test requirements. The initial function of the stainless steel liner plates is leak-tightness. All welds shall be examined in accordance with ASME Section III, Division2, Subsection CC 4544. All liner plate seam welds and other complete penetration welds shall be vacuum box tested for leak-tightness. Leak testing is required by ASME Section III, Division2, Subsection CC 5500.

The third sentence that “Unlike containment liner plate, none of the stainless steel liner plates are designed as structural members” will be revised in the markup for clarification. As described in DCD Section 3.8.1.4.10, the liner plate is not considered a structural member, but it is considered as a structure member during construction in the design since it is used as a concrete form.

The fourth sentence that “The stainless steel liner plate is not safety related structure” will be deleted in the markup since it was only stated to emphasize that the stainless steel structures for pools and sumps are not pressure boundary safety-related structures.

AWS D1.4 “structural welding code reinforcing steel” is not used in the APR1400 since mechanical splice and lap splice are used for reinforcing steel connection instead of welding connection. In addition, AWS D1.8 “Structural welding code Seismic supplement” is not used since seismic resistance system is not used in the APR1400.

f. Acceptable but Confirmatory.

The last paragraph in the original RAI question following Item f, and the subsequent feedback provided to KHNP (placed as part of Item f), were not addressed. The request was to review the completeness and accuracy of the codes, standards, specifications, and regulatory guides identified/described in the DCD, including the correct dates/editions. This confirmation was not provided and markups, such as those for DCD Table 3.8-1, were also not provided. Note that there were still a number of corrections to be made with examples (not a complete list) shown below.

For DCD Table 3.8-1: Doc. Ref. No. 4, Doc. Title (Nuclear mechanic - metal containment vessel) is incorrect; Doc. Ref. 6, “ASME” is generic, and so is the intent to refer to the entire ASME Code including all Sections?; and ASME Section XI, Subsections IWE and IWL are not listed.

For DCD Section 3.8.7 References, provided in this response and in the response to RAI 129-8085, Question 3.8.1-4 Rev. 1: does not include ASME Section XI, Subsections IWE and IWL; and ASME Section IX.

KHNP Input

The response will be revised to add ASME Section III, Division 1, Subsection NF, ASME Section XI, Subsection IWE and IWL, and ASME Section IX in DCD Tier 2, Table 3.8-1. The response will also be revised to add ASME Section III, Division 1, Subsection NF and ASME Section IX in DCD Tier 2, Subsection 3.8.7. ASME Section XI is being added to Subsection 3.8.7 in the response to RAI 199-8223 03.08.01-9 (Rev. 2).