

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Thursday, August 13, 2015 10:43 AM
To: KHNPDCDRAIsPEm Resource
Subject: FW: APR1400 Design Certification Application RAI 117-8061 (03.05.01.01 - Internally Generated Missiles (Outside Containment))
Attachments: APR1400 DC RAI 117 SPSB 8061.pdf

From: Ciocco, Jeff
Sent: Monday, July 27, 2015 9:55 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource <KHNPDCDRAIsPEm.Resource@nrc.gov>; Harry (Hyun Seung) Chang <hyunseung.chang@gmail.com>; Yunho Kim <yshh8226@gmail.com>; Steven Mannon <steven.mannon@aecom.com>
Cc: Nolan, Ryan <Ryan.Nolan@nrc.gov>; Dias, Antonio <Antonio.Dias@nrc.gov>; Betancourt, Luis <Luis.Betancourt@nrc.gov>; Lee, Samuel <Samuel.Lee@nrc.gov>
Subject: APR1400 Design Certification Application RAI 117-8061 (03.05.01.01 - Internally Generated Missiles (Outside Containment))

KHNP,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, KHNP requests, and we grant, 60 days to respond to the RAI question. We may adjust the schedule accordingly.

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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Created By: Jeff.Ciocco@nrc.gov

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REQUEST FOR ADDITIONAL INFORMATION 117-8061

Issue Date: 07/27/2015

Application Title: APR1400 Design Certification Review – 52-046

Operating Company: Korea Hydro & Nuclear Power Co. Ltd.

Docket No. 52-046

Review Section: 03.05.01.01 - Internally Generated Missiles (Outside Containment)

Application Section:

QUESTIONS

03.05.01.01-1

GDC 4, in part, requires SSCs important to safety to be protected from internally generated missiles. SRP 3.5.1.1 acceptance is based, in part, on meeting the guidance of RG 1.115 and RG 1.117. Appendix A of RG 1.115 and RG 1.117 provides guidance as to which SSCs should be protected against missiles; these lists include some SSCs that may not be classified as safety-related (e.g. gaseous radwaste treatment facility).

DCD Tier 2, Section 3.5, states “[m]issile protection is provided for safety-related equipment...,” and “[t]he protection of safety-related SSCs is accomplished by ...” It is unclear whether the APR 1400 design provides missile protection for all SSCs important to safety as required by GDC 4.

The applicant is requested to specify in the DCD if there are any nonsafety-related SSCs that require missile protection and provide justification if any SSCs listed in the aforementioned RGs are not protected from missiles; either internal or external.

03.05.01.01-2

GDC 4 requires SSCs important to safety to be protected from internally generated missiles. In addition, SRP 3.5.1.1 acceptance is based, in part, on meeting the guidance of RG 1.115 and RG 1.117.

DCD Tier 2, Section 3.5.1, states “the selection is based on the application of a single failure criterion to the retention features of the component.” However, the DCD does not specify whether a single failure of an SSC necessary for safe shutdown is assumed, as discussed in RG 1.115 and RG 1.117.

The applicant is requested to revise the DCD and demonstrate the APR 1400 design conforms to the guidance of RG 1.117 and RG 1.115 with respect to the single failure criterion and protection against missiles.

03.05.01.01-3

10 CFR 52.47(b)(1) requires that a DC application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations.

DCD Tier 1, Table 2.2.5-1, item 4 contains an ITAAC for internally-generated missiles. The acceptance criteria states, “the as-built nuclear island structure including EDG building conforms with the following criteria;” however, there are additional structures onsite that house SSCs that require missile protection.

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The applicant is requested to include in the aforementioned ITAAC all structures that house SSCs requiring missile protection or justify why those structures are omitted from the ITAAC.

03.05.01.01-4

GDC 4, in part, requires SSCs to be protected from internally generated missiles. In addition, 52.47(a)(2) requires the applicant to provide “a description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification ... required to show that safety functions will be accomplished.”

DCD Tier 2, Section 3.5.1.1 provides a list of components that are not considered credible missile sources; however, the applicant has not provided an adequate explanation or technical justification as to why the components are not credible. For example, the applicant uses non-specific terms and phrases, such as, “valves constructed in accordance with regulation,” “ASME vessels,” and “industry pump,” without specifying the specific regulation or ASME section.

The applicant is requested to provide in DCD Tier 2, Section 3.5.1.1, the design criteria and applied codes and standards that demonstrate a high level of quality (e.g. material, design, fabrication, examination, testing, over pressure protection) thus assuring structural integrity of the components in order to conclude that the missile sources are not considered credible.

03.05.01.01-5

GDC 4, in part, requires SSCs to be protected from internally generated missiles. In addition, 52.47(a)(2) requires the applicant to provide “a description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification ... required to show that safety functions will be accomplished.”

DCD Tier 2, Section 3.5.1.1 and Section 3.5.1.2 use the sub-categories of “NSSS Components” and “BOP Components.” It is unclear what the definition and purpose of these sub-categories are. In addition, it is unclear whether these sub-sections provide a description of all potential missile sources or a description of what needs to be protected. Missiles can be generated from many different sources, not just safety-related, and it is unclear to the staff whether the two aforementioned sub-categories include the appropriate scope of potential missiles.

The applicant is requested to revise DCD Tier 2, Sections 3.5.1.1 and 3.5.1.2, in order to clarify what is meant by “NSSS Components” and “BOP components” and demonstrate that all sources of potential internally-generated missiles have been evaluated.

03.05.01.01-6

GDC 4 requires SSCs important to safety to be protected from internally generated missiles. In addition, SRP 3.5.1.1 acceptance is based, in part, on meeting the guidance of RG 1.115 and RG 1.117.

During the review of DCD Tier 2, Section 3.5.1.1, the staff noted the following items that need to be clarified:

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1. DCD Tier 2, Section 3.5.1.1.2.1, states “[s]afety-related NSSS pumps and associated motors are considered rotating missile generation source outside containment;” however; this section discusses pressurized components, not rotating components. Staff requests the applicant to clarify this statement in the DCD.
2. DCD Tier 2, Section 3.5.1.1.1.1, states “safety-related NSSS pumps and associated motors.” The staff requests the applicant to clarify why this statement is specific to safety-related and does not include nonsafety-related pumps.
3. DCD Tier 2, Section 3.5.1.1.1.2 states the turbine building does not contain any safety-related systems or components and does not require design for protection from rotating components that become missiles. The staff requests the applicant to specify if this statement is also true for pressurized components.
4. DCD Tier 2, Section 3.5.1.1 uses a unique term, “basement.” The staff requests the applicant to either clarify what is meant by “basement” or revise the text to be consistent with common industry terms.



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