

## KHNPDCDRAIsPEm Resource

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**From:** Ciocco, Jeff  
**Sent:** Friday, August 21, 2015 8:41 AM  
**To:** KHNPDCDRAIsPEm Resource  
**Subject:** FW: APR1400 Design Certification Application RAI 113-8062 (03.05.01.02 - Internally Generated Missiles (Inside Containment))  
**Attachments:** image001.jpg; APR1400 DC RAI 113 SPSB 8062.pdf

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**From:** Ciocco, Jeff  
**Sent:** Monday, July 27, 2015 8:39 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 113-8062 (03.05.01.02 - Internally Generated Missiles (Inside 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,

Jeff Ciocco  
New Nuclear Reactor Licensing  
301.415.6391  
[jeff.ciocco@nrc.gov](mailto:jeff.ciocco@nrc.gov)



**Hearing Identifier:** KHNP\_APR1400\_DCD\_RAI\_Public  
**Email Number:** 206

**Mail Envelope Properties** (d5645754e96541c5b6af4a785ae72d11)

**Subject:** FW: APR1400 Design Certification Application RAI 113-8062 (03.05.01.02 - Internally Generated Missiles (Inside Containment))  
**Sent Date:** 8/21/2015 8:40:37 AM  
**Received Date:** 8/21/2015 8:40:38 AM  
**From:** Ciocco, Jeff

**Created By:** Jeff.Ciocco@nrc.gov

**Recipients:**  
"KHNPDCDRAIsPEm Resource" <KHNPDCDRAIsPEm.Resource@nrc.gov>  
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MESSAGE	1212	8/21/2015 8:40:38 AM
image001.jpg	5056	
APR1400 DC RAI 113 SPSB 8062.pdf		91294

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
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## REQUEST FOR ADDITIONAL INFORMATION 113-8062

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: 03.05.01.02 - Internally Generated Missiles (Inside Containment)

Application Section:

### QUESTIONS

03.05.01.02-1

GDC 4 requires SSCs to be protected from internally-generated missiles. Maintenance equipment that is not secured or removed from an area is a potential gravitational missile source. SRP 3.5.1.2 specifies that unsecured maintenance equipment should be removed from containment prior to operation, moved to a location where it is not a potential hazard to SSCs important to safety, or seismically restrained to prevent it from becoming a missile.

DCD Tier 2, Section 3.5.1.2 doesn't seem to include an evaluation of internal missiles resulting from failures of unsecured maintenance equipment.

The applicant is requested to provide an assessment of potential gravitational missiles from unsecured maintenance equipment and discuss the measures provided to prevent the impact of it falling on safety-related SSCs. DCD Tier 2 Table 1.8.2, should be revised to include a COL information item to establish/provide procedures which ensure that equipment, such as a hoist that is required during maintenance, be either removed or seismically restrained following maintenance to prevent it from becoming a missile.

03.05.01.02-2

GDC 4 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 3.5.1.2 does not include an adequate assessment for certain internally-generated missiles. For example, the applicant has not adequately addressed why the RCP flywheel or pressure vessels are not considered postulated missiles. In addition, the design criteria of ANSI Class 900 alone is not sufficient justification of quality for excluding valves as a missile source.

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

03.05.01.02-3

GDC 4 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

## REQUEST FOR ADDITIONAL INFORMATION 113-8062

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 3.5.1.2 uses the phrases “additional protective features” and “protective features inside containment;” however, it is not clear to the staff what the protective features are referring to.

The applicant is requested to provide additional information in the DCD in order to clarify what is meant by “protective features” and “protective features inside containment.”

03.05.01.02-4

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 3.5.1.2 states “[e]ngineered safety features, except for some portions of piping for direct vessel injection following a LOCA, are located outside the secondary shield wall to minimize the effects from missiles generated by the RCPB.” However, the applicant has not specified how the piping portions for direct vessel injection will be protected from internally-generated missiles.

The applicant is requested to provide a discussion in the DCD detailing the method of missile protection for those portions of piping not protected from the secondary shield wall.

03.05.01.02-5

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.”

During the review of DCD Tier 2, Section 3.5.1.2, the staff noted the following items that need to be clarified:

1. DCD Tier 2, Section 3.5.1.2.2.2 states “[m]ost of the valves installed on a high-energy line are designed according to ANSI Class 900 ...” The applicant is request to identify the valves that are not designed to this criteria and explain why they are not considered credible missiles.
2. DCD Tier 2, Section 3.5.1.2.1.2 states “[t]he only safety-related BOP rotating components inside the containment are ... pump impellers, and blades of turbine-driven components.” It is unclear to the staff what equipment the applicant is referring to in the aforementioned statement. The applicant is requested to clarify what BOP pumps and turbine-driven components are located inside containment.