

## **KHNPDCDRAIsPEm Resource**

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**From:** Ciocco, Jeff  
**Sent:** Monday, November 16, 2015 11:06 AM  
**To:** apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; Christopher Tyree  
**Cc:** Stutzcage, Edward; McCoppin, Michael; Olson, Bruce; Vera, John; Lee, Samuel  
**Subject:** APR1400 Design Certification Application RAI 309-8389 (12.03-12.04 - Radiation Protection Design Features)  
**Attachments:** APR1400 DC RAI 309 RPAC 8389.pdf

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, 45 days to respond to this RAI. 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  
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**From:** Ciocco, Jeff  
**Created By:** Jeff.Ciocco@nrc.gov

**Recipients:**

"Stutzcage, Edward" <Edward.Stutzcage@nrc.gov>  
Tracking Status: None  
"McCoppin, Michael" <Michael.McCoppin@nrc.gov>  
Tracking Status: None  
"Olson, Bruce" <Bruce.Olson@nrc.gov>  
Tracking Status: None  
"Vera, John" <John.Vera@nrc.gov>  
Tracking Status: None  
"Lee, Samuel" <Samuel.Lee@nrc.gov>  
Tracking Status: None  
"apr1400rai@khnp.co.kr" <apr1400rai@khnp.co.kr>  
Tracking Status: None  
"KHNPDCDRAIsPEM Resource" <KHNPDCDRAIsPEM.Resource@nrc.gov>  
Tracking Status: None  
"Harry (Hyun Seung) Chang" <hyunseung.chang@gmail.com>  
Tracking Status: None  
"Andy Jiyong Oh" <jiyong.oh5@gmail.com>  
Tracking Status: None  
"Christopher Tyree" <Christopher.tyree@aecom.com>  
Tracking Status: None

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# REQUEST FOR ADDITIONAL INFORMATION 309-8389

Issue Date: 11/16/2015  
Application Title: APR1400 Design Certification Review – 52-046  
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.  
Docket No. 52-046  
Review Section: 12.03-12.04 - Radiation Protection Design Features  
Application Section: 12.3

## QUESTIONS

12.03-48

This is a follow-up to the response to RAI 7999, Question 12.03-7.

### REQUIREMENTS

10 CFR 20.1101(b) requires that the licensee use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).

10 CFR 20.1406(b) requires that applicants for standard design certifications describe in the application how facility design will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

### ISSUE / ADDITIONAL INFORMATION NEEDED

In the response to RAI 7999, Question 12.03-7, the applicant provided additional information on the cobalt content of components in contact with primary coolant. While the response specified additional limitations on cobalt content for certain components and expanded on the information originally provided in the FSAR, it is unclear that the information provided is entirely consistent with guidance documents referenced in the SRP, including RG 8.8 and EPRI TR-016780. Specifically, RG 8.8 states that low-cobalt material should be used for materials in contact with reactor coolant to the extent practical and EPRI TR-016780 states that justification should be provided for the use of cobalt-based alloys and that they should only be used where no proven alternative exists.

Therefore, the staff has the following questions:

1. In the response to Question 12.03-7, the applicant provided a proposed FSAR markup to Table 12.3-1, which provides the cobalt content for reactor coolant system components. The markup does not provide any cobalt limitations for the impeller in the reactor coolant pumps or for the metals in fuel assemblies. Please specify the cobalt content of these components in FSAR Table 12.3-1, or justify why the cobalt content in these components do not need to be limited.
2. Note 5 of the proposed FSAR Table 12.3-1 markup states that small quantities of cobalt base alloy will be used in bar, casting, or hardfacing of the control element drive mechanism, reactor vessel internal, pumps, or valves. Consistent with EPRI TR-016780, provide additional information on where cobalt base alloys will be used and provide justification for why they are being used. Update the FSAR accordingly.
3. RG 8.8 and EPRI TR-016780 both specify that the cobalt content for materials in contact with reactor coolant should be limited, however, in the response to Question 12.03-7 the applicant indicates that the cobalt content of materials other than those in the RCS is not limited, without providing any justification or reasoning for why they will not be limited. Please justify why it is not necessary to limit the cobalt content in these systems in the APR 1400 design or update FSAR Section 12.3 to provide information regarding cobalt levels and how cobalt will be limited for these systems, or as is otherwise appropriate.



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