

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, November 09, 2015 8:53 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; Erin Wisler
Cc: Green, Brian; Junge, Michael; Ward, William; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 298-8356 (18 - Human Factors Engineering)
Attachments: APR1400 DC RAI 298 COLP 8356.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, 90 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,

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REQUEST FOR ADDITIONAL INFORMATION 298-8356

Issue Date: 11/09/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 18 - Human Factors Engineering
Application Section: 18.1

QUESTIONS

18-41

NUREG-0711 Section 2.4.4 "Tracking HFE Issues" Criterion 2, "Method," states "The applicant's method should:

- *track issues until the potential for negative effects on human performance is reduced to an acceptable level."*

The September 11, 2015 RAI response letter (ADAMS Accession No. ML15254A492) to RAI 54-7963, Question No 18-8 response indicates that the prioritization and justification for no actions being needed for Priority 3 HEDs are documented in the ITS. In addition, Section 4.6.1.4 "Human Engineering Discrepancies Closeout" in APR1400-E-I-NR-14001, Rev. 0, suggests that HEDs that do not "require any actions" do not "require further tracking." This statement is inconsistent with this NUREG-0711 criterion.

It remains unclear how these Priority 3 HEDs are tracked to assure that they do not create synergistic effects that can affect safety. In other words, although a single Priority 3 HED may not have any likely safety effects, it may be possible for multiple Priority 3 HEDs to sum together to cause safety issues. The HED tracking system should be capable of tracking/trending all HEDs until it is clear that the potential negative effects are reduced to acceptable levels.

For instance, if a switch is mistakenly installed in an inappropriate position, the corresponding HED may be correctly classified as Priority 3 if erroneous operation of the switch will not cause a degradation of safety (Priority 1 HED) or have a negative effect on efficiency (Priority 2 HED). If however, if a systematic error in installation caused many similar switches to be installed in the wrong positions, there may be synergistic effects that result from the resulting confusion in operators.

Additional information is needed to explain how Priority 3 HEDs are tracked/trended to assure there are no cumulative effects caused by multiple unresolved Priority 3 HEDs.



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