KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Tuesday, March 01, 2016 9:03 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Andy Jiyong Oh; James Ross
Cc: Nolan, Ryan; Dias, Antonio; Steckel, James; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 424-8532 (19.05 Aircraft Impact Assessment (APR1400))
Attachments: APR1400 DC RAI 424 SPSB 8532.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, the following RAI question response times. We may adjust the schedule accordingly.

19.05 Aircraft Impact Assessment (APR1400)-2: 60 days
19.05 Aircraft Impact Assessment (APR1400)-3: 45 days
19.05 Aircraft Impact Assessment (APR1400)-4: 45 days

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

Thank you,

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U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

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REQUEST FOR ADDITIONAL INFORMATION 424-8532

Issue Date: 03/01/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 19.05 Aircraft Impact Assessment (APR1400)
Application Section: SRP 19.5

QUESTIONS

19.05 Aircraft Impact Assessment (APR1400)-2

In accordance with 10 CFR 50.150(a)(1), each applicant listed in paragraph (a)(3) shall perform a design-specific assessment of the effects on the facility of the impact of a large, commercial aircraft. Using realistic analyses, the applicant shall identify and incorporate into the design those design features and functional capabilities to show that, with reduced use of operator actions:

(i) The reactor core remains cooled, or the containment remains intact; and
(ii) Spent fuel cooling or spent fuel pool integrity is maintained.

In addition, 10 CFR 50.150(b) requires that the FSAR contain a description of the design features and functional capabilities and how the design features and functional capabilities meet the assessment requirements.

To ensure compliance with 10 CFR 50.150, the staff requests that the applicant address the following:

a. DCD Tier 2, Section 19.5.4.1, lists key components inside containment; however, it neither adequately describes the design features and functional capabilities nor, alternately, references the associated DCD section. The applicant is requested to ensure that the design features are adequately described in DCD Tier 2, Section 19.5, or a reference to the associated DCD section exists.

b. DCD Tier 2, Section 19.5.4.2, item d, states the properties of concrete and reinforcement bars protect key design features in the auxiliary building; however, it does not discuss other buildings or structures which are also credited for protecting key design features (e.g. emergency diesel generator building). The applicant is requested to verify and confirm that the DCD contains a complete list of structures or buildings credited for protecting core cooling equipment, or spent fuel pool integrity.

c. DCD Tier 2, Section 19.5.4.2, item e, states that the location of the AAC GTG, as shown on Figure 1.2-1, is a key design feature for limiting the loss of electrical power to key safety systems; however, Figure 1.2-1 is a high-level sketch of the site arrangement and does not provide an accurate representation of the separation distance required to protect the AAC GTG. The applicant is requested to provide a description, in the DCD, of the separation distance necessary to protect the AAC GTG and its components.

   DCD Tier 2, Section 19.5.4.4, lists the AAC GTG as a key design feature for providing power to various equipment; however this system is neither adequately described nor, alternately, references the associated DCD section. The applicant is requested to

ensure that this non-class 1E power source is adequately described in DCD Tier 2, Section 19.5, or a reference to the associated DCD section exists.

d. DCD Tier 2, Section 19.5.4.4, describes support equipment and systems necessary to maintain core cooling; however, it is not clear to the staff whether the essential chilled water system, the ultimate heat sink, or others are missing from DCD Tier 2, Section 19.5.4.4. The applicant is requested to verify and confirm that the DCD contains a complete list of key design features credited for core cooling.

e. NEI 07-13 states that the effects of smoke can greatly affect the ventilation systems and diesel generators. It is not clear to the staff whether the AIA included the effects of smoke on ventilation, diesel generators, or other components such as cooling towers, as discussed in NEI 07-13. The applicant is requested to confirm that the AIA accounted for these smoke effects and the DCD is appropriately revised.

19.05 Aircraft Impact Assessment (APR1400)-3

10 CFR 50.150(a) requires applicants to perform an assessment of aircraft impacts on the nuclear reactor facility. The staff considers conformance with the guidance in NEI 07-13, Revision 8, an acceptable method for meeting those requirements.

DCD Tier 2 Section 19.5.1 states that the guidelines of NEI-07-13 were fully followed with no exceptions taken. NEI 07-13, Revision 8, specifies that, for the evaluation of shutdown cooling scenarios, equipment in the division of the non-operating loop is assumed to be out of service for maintenance. DCD Tier 2, Section 19.5.4.4 states:

> To ensure that one train of fuel cooling or inventory makeup is available following the impact of a large commercial aircraft on the AB, administrative controls require that no trains of the safety injection and shutdown cooling system and necessary support systems are out of service when the reactor vessel head is untensioned and the reactor vessel water level is at or near the reactor vessel head flange.

The applicant is requested to explain why this statement is not considered an exception or deviation from NEI 07-13, Revision 8.

19.05 Aircraft Impact Assessment (APR1400)-4

10 CFR 50.150(a) requires applicants to perform an assessment of aircraft impacts on the nuclear reactor facility. SRP 19.5 specifies that, as part of core cooling, front line systems, support systems, and borated water may be required to maintain the core with sufficient shutdown margin.

DCD Tier 2, Section 19.5.4.4 states “heat is discharged to the atmosphere using the main steam safety valves or main steam atmospheric dump valves. Under these conditions, additional boration is unnecessary to maintain subcriticality.”

REQUEST FOR ADDITIONAL INFORMATION 424-8532

The applicant is requested to explain if there are certain scenarios or strike locations in which borated water is necessary for maintaining adequate shutdown margin.