

## **KHNPDCDRAIsPEm Resource**

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**Sent:** Wednesday, October 14, 2015 7:14 AM  
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**Cc:** Andrukat, Dennis; Dias, Antonio; Wunder, George; Lee, Samuel  
**Subject:** APR1400 Design Certification Application RAI 244-8326 (09.03.03 - Equipment and Floor Drainage System)  
**Attachments:** APR1400 DC RAI 244 SPSB 8326.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, 60 days to respond to RAI questions 09.03.03-3 and 09.03.03-4 . 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 244-8326

Issue Date: 10/14/2015

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 09.03.03 - Equipment and Floor Drainage System

Application Section: GDC 2, GDC 4, GDC 60; SRP 9.3.3

### QUESTIONS

#### 09.03.03-1

GDC 2 requires the capability of safety-related system portions of the Equipment and Floor Drainage System (EFDS) to withstand the effects of natural phenomena (such as seismic event, floods, etc.) without loss of capability to perform safety functions.

As stipulated in item III.1.B of SRP Section 9.3.3, "Equipment and Floor Drainage System," if the EFDS can result in the inundation of safety-related areas due to drain backflow from malfunction of active components, blockage, or the probable maximum flood, then then this portion of the EFDS is considered safety-related in that area.

DCD Tier 2, Section 9.3.3.3, states that the check valves installed in the outlet piping of the engineered safety features (ESF) pump room sump pump is to prevent flooding by backflows. However, there is no mention whether these check valves are safety-related.

The applicant is requested to clarify in the DCD whether the check valves are safety-related and provide justification if they are not to be safety-related.

#### 09.03.03-2

GDC 4 requires, in part, that systems, structures, and components (SSCs) important to safety be "appropriately protected against dynamic effects, including...the effects of discharging fluids ..."

As stipulated in item III.1.D of SRP Section 9.3.3, "Equipment and Floor Drainage System," if a failure or malfunction in a portion of the EFDS could adversely affect safety-related (including accident mitigation) SSCs then this portion of the EFDS is considered safety-related.

DCD Tier 2, Section 9.3.3.2.5, "System Operation," and Figure 9.3.3, indicate that the engineered safety features (ESF) pump room sump contains one sump pump each, while the rest of the EFDS sumps contain redundant sump pumps. During the review, the staff could not find further information regarding the failure or malfunction of an ESF pump room sump pump and the effects that could compromise the safety-related SSCs in that ESF pump room.

The applicant is requested to provide additional information as to how the EFDS design meets GDC 4 given a single failure of the only sump pump in any one of the ESF pump rooms.

## REQUEST FOR ADDITIONAL INFORMATION 244-8326

### 09.03.03-3

GDC 60 requires, in part, a power unit design to “include means to control suitably the release of radioactive materials in liquid effluents ... produced during normal reactor operation, including anticipated operating occurrences.” 10 CFR 52.6 requires, in part, that information provided to the Commission under Part 52 shall be complete and accurate in all material respects.

As stipulated in item III.2 of SRP Section 9.3.3, “Equipment and Floor Drainage System,” the EFDS performance requirements are reviewed for whether they describe component allowable operational degradation. The SRP continues and states that the drawings and descriptions are reviewed for whether safety-related EFDS portions are identified correctly and can be isolated from nonsafety-related portions.

DCD Tier 2, Figure 9.3.3, “Equipment and Floor Drainage System,” depicts the EFDS including the radioactive subsystem in the auxiliary building. However, this figure only shows certain portions of the EFDS, specifically the radioactive portions in the auxiliary and compound buildings. This figure is missing information depicting the reactor containment building subsystems, the turbine generator building subsystems, and the identification of the safety-related and nonsafety-related portions of the EFDS. In addition, the figure does not show the interconnection of the turbine generating building sump pump discharge between the liquid waste management system (LWMS) and the waste water treatment facility (WWTF).

The applicant is requested to provide the above information in DCD Tier 2, Table 3.2-1, Figure 9.3.3, and Section 9.3.3, in order for the staff to adequately review the EFDS design against GDC 60.

### 09.03.03-4

GDC 60 requires, in part, a power unit design to “include means to control suitably the release of radioactive materials in liquid effluents ... produced during normal reactor operation, including anticipated operating occurrences.”

DCD Tier 2, Section 9.3.3.2.2, states that the turbine generating building sump radiation monitors are interlocked with the sump discharge valves to provide proper routing of contaminated fluid. However, the staff is unable to fully determine the operation and circumstances of sump discharge valve operation and thus cannot determine whether the design meets GDC 60 to control suitable releases of radioactive effluents.

The applicant is requested to provide additional information as to how these valves change the flow path in order to conclude whether this is an automatic function or operator action is required.



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