

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 12-7902

SRP Section: 06.02.02 - Containment Heat Removal Systems

Application Section: 6.2.2

Date of RAI Issued: 05/22/2015

Question No. 06.02.02-1

10 CFR 50.46(b)(5) requires, in part, that after successful operation of the emergency core cooling system (ECCS), that decay heat shall be removed for the extended period of time required by the long lived radionuclides. Inherent in this requirement is that ECCS systems have adequate net positive suction head (NPSH) margin in the presence of LOCA generated debris.

Although the APR1400 design addresses latent debris, and states that no fibrous insulation is located within break zones of influence (ZOIs), other potential sources of fibrous insulation (such as power/instrument cable filler in cables within the ZOI that are damaged) is not discussed. In the design control document (DCD) and technical report APR1400-E-NNR-14001-P, update the discussion on fibrous debris to include whether other components in the ZOI contain fiber and, if any is included, disposition the fiber as part of the debris loading.

Staff requires this information in order to be assured that all sources of fiber within the design are considered, as the margin for additional fiber loading in the plant is extremely low and fiber is a primary driver for the strainer performance, which could affect the capability of the ECCS to provide adequate long term core cooling.

Response

No fibrous insulation is used inside the containment as described in DCD Section 6.1.1.2.3. The power/instrument cable filler material in cables within the ZOI is polypropylene and does not contain fiber. All sources of fiber within the design that could affect the capability of the ECCS to provide adequate long term core cooling have been reviewed.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

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10 CFR 50.46(b)(5) requires, in part, that after successful operation of the ECCS systems, that decay heat shall be removed for the extended period of time required by the long lived radionuclides. Inherent in this requirement is that ECCS systems have adequate net positive suction head (NPSH) margin in the presence of LOCA generated debris.

The APR1400 design follows the guidance offered in NEI 04-07 and the associated staff safety evaluation in determining the debris loading. Although APR1400 uses 200 lbm of latent debris as suggested by NEI 04-07, only 7.5% of this debris is considered fiber (rather than the 15% recommended by the guidance). Provide a justification for the reduction in fiber loading in technical report AP1400-E-N-NR-14001-P, "Design Features to Address GSI-191."

Response

The APR1400 design considers only 7.5% of latent debris to be fiber. The fiber of 15% suggested by NEI 04-07 is not applied; however, the APR1400 ensures successful operation of the ECCS by administrative controls that a licensee implements such as containment cleanliness, housekeeping, and the foreign materials exclusion program as described in DCD Section 6.8.4.5.10.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

Impact on Technical Specifications

There is no impact on the Technical Specifications.