
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.: 519-8687
SRP Section: 06.02.02 - Containment Heat Removal Systems
Application Section: 6.2.2
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Question No. 06.02.02-1

NRC regulations in 10 CFR 52.47, "Contents of Applications," require that the application must contain a description of the system, structures, and components of the facility and the description shall be sufficient to understand the system design. In order for this requirement to be met, the staff is requesting additional information regarding the mesh size of the holdup volume tank (HVT) trash rack.

Technical Report APR1400-E-N-NR-14001-P, Rev. 0, "Design Features to Address GSI-191," Section 2.3 states that the HVT trash racks prevent debris particles larger than 1.5 inch from entering the HVT. However, Technical Report APR1400-E-N-NR-14002-NP, Rev.0, "IRWST Sump Strainer and Trash Rack Structural Analysis," Section 2.1 states that debris greater than 4 inch diameter is prevented from entering the HVT by a vertical trash rack and Section 2.2 states that the trash rack is designed to prevent debris larger than 4 inch. These two technical reports appear to inconsistently describe the HVT trash rack mesh size as both 1.5 inch and 4 inch. The applicant is requested to specify the HVT trash rack mesh size and to revise the technical reports as applicable to consistently describe the HVT trash rack mesh size.

Response

The HVT trash racks prevent debris particles larger than 1.5 inch from entering the HVT because the HVT trash rack mesh size is 1.5 inch. Technical Report APR1400-E-N-NR-14002-NP, Rev.0, Section 2.1 and Section 2.2 will be revised to be consistent with Technical Report APR1400-E-N-NR-14001-P, Rev. 0.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

Technical Report APR1400-E-N-NR-14002-NP, Sections 2.1 and 2.2 will be revised as indicated in the attachment.

2 TRASH RACK STRUCTURAL ANALYSIS

2.1 Description of Trash Rack

The In-containment Refueling Water Storage Tank (IRWST) spillways allow accumulated water in the adjacent Holdup Volume Tank (HVT) to spill into the IRWST thereby replenishing the IRWST water volume. The spillways are adequately sized to allow the maximum flow into the HVT to be returned to the IRWST after filling. The vertical screen, which is trash rack, is provided at the entrance of the HVT to prevent debris from entering the HVT and thus the IRWST.

Following an accident, water introduced into containment drains to the HVT. Debris that may exist in containment may be transported to the HVT with this fluid. Debris greater than ~~101.6 mm (4 inch)~~ diameter is prevented from entering the HVT by a vertical trash rack, which is located at the entrance to the HVT (Figure 2-1). A trench exists at the base of this trash rack to prevent high density debris that may be swept along the floor by fluid flow toward the HVT from reaching the trash rack. The vertical orientation of the trash rack will help impede the deposition of debris buildup on the strainer surface. Particles that are smaller than the trash rack mesh will enter the HVT. The figure 2-1 shows the location of trash rack and the figure 2-2 shows the 3D view of trash rack.

2.2 Trash Rack Analysis

The trash rack is designed with grating mesh. The both sides of grating mesh are supported by steel and concrete structures as shown on Figure 2-2.

As the trash rack is designed to prevent debris larger than ~~101.6 mm (4 inch)~~, water flow blockage will not happen even though the grating mesh is blocked by debris. Therefore the hydraulic-pressure load due to blockage will be negligible. But the trash rack is designed to resist the hydraulic pressure load of 2.3 m (90.5 in) water depth assuming hydraulic water pressure buildup due to grating mesh blockage. In addition, the trash rack is designed considering seismic load due to self weight excitation of grating mesh. But, the seismic load is negligible since the self-weight of grating mesh is very small compared to the assumed hydraulic pressure load.

38.1 mm (1.5 inch)