
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.: 392-8464
SRP Section: 09.03.02 – Process and Post Accident Sampling System
Application Section: 9.3.2
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Question No. 09.03.02-1

To satisfy the requirements of GDC 60 and 64, RG 1.21 recommends prompt analysis to minimize decay of radionuclides (C.8). Also, NUREG-0737 recommends prompt sampling under accident conditions [p. II.B.3.1-2, note (1)]. In addition, GDC14 requires strict chemistry controls to assure the integrity of the RCPB. Some of these controls require immediate action if limits are violations promptly. Thus, SRP 9.3.2 recommends a review of operational procedures to verify the capability to promptly obtain samples. The PSS has a variety of sampling points and expected conditions, but the DCD makes no mention of processing time at all.

Please provide estimates for the time needed to obtain, cool, and prepare samples, and to perform the sample analysis. There are a variety of sample points, and processing may vary for individual points.

Response

The time needed to perform sampling and analysis can be estimated from the operating experience of the nuclear power plants in Korea. During normal operation, obtaining, cooling, and preparing samples will be performed within 1 hour. This process consists of transferring to the sample room, preparing the sampling line, purging the sampling line, obtaining the sample, and transferring the sample to the laboratory. This processing time is appropriate for protecting personnel from excessive radiation exposures. Performing the sample analysis can be completed in less than 4 hours. This ensures minimum loss of short-lived radionuclides by decay.

In order to maintain the integrity of the RCPB, some chemistry control parameters such as concentrations of chloride, fluoride, and dissolved oxygen of the RCS should be monitored on a periodic basis during normal operating conditions. The control values of the parameters and associated action levels are defined for protecting system materials based on EPRI PWR Primary Water Chemistry Guidelines. If one of these parameters exceeds a control limit,

immediate actions are taken in accordance with the associated action level. The total time required for sampling and sample analysis during normal operation permits the operator to take remedial action within the action time limit corresponding to the specific action level.

During post-accident conditions, it is estimated that the time needed for obtaining, cooling, and diluting a post-accident liquid sample will be approximately 1 hour. The process includes transferring to the sample room, preparing the sampling line, purging the sampling line, obtaining post-accident sample, transferring the sample to the laboratory, and diluting the sample. The time needed to perform sample analysis will be less than 2 hours in compliance with the requirement in NUREG-0737.

The total time it will take to perform sampling and analysis during the post accident condition is within the time requirement stated in DCD 9.3.2.1(h).

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

There is no impact on any Technical, Topical, or Environment Report