
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.: 456-8566
SRP Section: 09.05.01 – Fire Protection Program
Application Section: 9.5.1 Fire Protection
Date of RAI Issue: 04/05/2016

Question No. 09.05.01-40

In its response to RAI 09.05.01-23, the applicant provided a markup to DCD Tier 2, Page 9.5A-11 as follows:

“For this FHA, the zone of influence is taken within a fire area or fire zone as rendering all equipment within that fire area or fire zone as inoperable and entry into the area or fire zone is assumed impossible for any operator actions. Similar to the assumptions for fire areas it is assumed that equipment that is not beneficial to safe shutdown will continue to operate, since no beneficial fire effects are credited. Fire cannot be credited to help place equipment in the desired position, but the extent of fire damage and impact is limited to the boundaries of the fire zone in which the fire occurs.”

SECY 90-016, “Evolutionary Light Water Reactor (LWR) Certification Issues and their Relationship to Current Regulatory Requirements,” states in part:

“Therefore the evolutionary ALWR designers must ensure that safe shutdown can be achieved, assuming that all equipment in any one fire area will be rendered inoperable by fire and that re-entry into the fire area for repairs and operator actions is not possible.”

The staff finds the above noted paragraph from page 9.5A-11 of the DCD contradictory since in the first sentence the applicant states that all equipment within the fire area is rendered inoperable while in the second sentence the applicant states that equipment that is not beneficial to safe shutdown will continue to operate. The second sentence also contradicts the guidance from SECY 90-016.

The applicant is requested to remove the sentence that indicates equipment that is not beneficial to safe shutdown will continue to operate.

Response

In DCD Tier 2, Page 9.5A-11, the sentence that indicates equipment that is not beneficial to safe shutdown will continue to operate will be removed.

Impact on DCD

DCD Tier 2, Page 9.5A-11 will be revised as indicated in Attachment.

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 Environmental Report.

APR1400 DCD TIER 2

For this FHA, the zone of influence is taken within a fire area or fire zone as rendering all equipment within that fire area or fire zone as inoperable and entry into the area or fire zone is assumed impossible for any operator actions. ~~Similar to the assumptions for fire areas, if equipment is not in its desired position for continued operation, it is assumed operating. Fire cannot be credited to help place equipment in the desired position, but the extent of fire damage and impact is limited to the boundaries of the fire zone in which the fire occurs.~~

DeleteTheManual Operation

Manual operations or repair operations in a fire-affected area are assumed to be impossible.

For a fire in the MCR, evacuation of the MCR is assumed. However, credit is taken for a reactor trip and verification of the control element assembly (CEA) insertion prior to evacuation. CEA insertion is sufficient to provide reasonable assurance of subcriticality to maintain hot standby. If a manual scram from the control room is not possible prior to exiting, this action can be performed in the RSR. For fires outside the MCR, the operators are assumed to remain in the MCR and to use the instruments and controls in the MCR to the greatest possible extent, in accordance with station procedures.

No other manual actions are required for safe reactor shutdown, which can be accomplished from either the MCR or the RSR.

High-Low Pressure Interface

All interfaces of the reactor coolant system with other plant fluid systems that use electrically actuated valves for isolation of the reactor coolant pressure boundary are reviewed. An evaluation is performed for each interface to determine whether a single fire could result in an uncontrolled loss of reactor coolant due to the inadvertent actuation of a valve(s). Spurious opening of valves is considered to occur as a result of shorts within a single cable (wire-to-wire shorts), shorts between separate cables (cable-to-cable hot shorts), or open circuits (if applicable). Where redundant valves in series are used to prevent damage in the event of a single failure in a redundant valve, appropriate fire separation and installation are provided to prevent a fire-induced failure from resulting in a violation of a high-low pressure interface.