ArevaEPRDCPEm Resource

From: Getachew Tesfaye
Sent: Friday, December 05, 2008 11:36 AM
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Cc: Edward McCann; Robert Radlinski; Peter Hearn; Joseph Colaccino; John Rycyna; ArevaEPRDCPEm Resource
Subject: Draft - U.S. EPR Design Certification Application RAI No. 151 (1689), FSAR Ch. 9
Attachments: Draft RAI_151_SFPT_1689.doc

Attached please find draft RAI No. 151 regarding your application for standard design certification of the U.S. EPR. If you have any question or need clarifications regarding this RAI, please let me know as soon as possible, I will have our technical Staff available to discuss them with you.

Please also review the RAI to ensure that we have not inadvertently included proprietary information. If there are any proprietary information, please let me know within the next ten days. If I do not hear from you within the next ten days, I will assume there are none and will make the draft RAI publicly available.

Thanks,
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Request for Additional Information No. 151 (1689), Revision 0

12/5/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.05.01 - Fire Protection Program
Application Section: 9.5.1

QUESTIONS for Fire Protection Team (SFPT)

09.05.01-54

RG 1.189 Regulatory Position 6.2.6 states that "Cooling towers should be constructed of noncombustible construction or be located and protected in such a way that a fire will not adversely affect any systems or equipment important to safety. Cooling towers should be of noncombustible construction when the basins are used for the ultimate heat sink or for the fire protection water supply." The FSAR does not address RG 1.189 guidance for cooling towers. Address in FSAR Section 9.5.1 the fire protection design criteria for the Essential Service Water Cooling Tower Structure and for the Circulating Water System Cooling Tower Structure.

09.05.01-55

FSAR Table 9A-2 appears to have incorrect figure references for columns 85 through 99. Review FSAR Table 9A-2 to determine if the Figures referenced are correct and update as necessary.

09.05.01-56

Response to RAI No. 25, Revision 0 for Question 09.05.01-45 stated that "The Fire Protection Analysis (FPA) will assess postulated fires on a scenario-by- scenario basis. Where quantitative and computational methods are employed, recognized fire protection engineering practices, methods and analytical tools, such as those promulgated by NUREG-1805 and NUREG- 1824, will be utilized and appropriately applied." Describe in the FSAR the specific recognized fire protection practices and criteria for providing detection and suppression that are to be employed when using analytical tools.

09.05.01-57

Response to RAI No. 25, Revision 0 for Question 09.05.01-47 stated that "Outside oil-filled transformers are separated from plant buildings and from each other in accordance with the guidance in NFPA 804 by either distance or two-hour rated fire barriers. Where the distance from transformer to plant building is less than fifty feet, or distance between transformers is less than thirty feet, fire barriers are provided for separation." RG 1.189 Regulatory Position 7.3 states that "Such transformers should be located at least 15.2 m

(50 ft) distant from the building, or building walls within 15.2 m (50 ft) of oil-filled transformers should be without openings and have a fire-resistance rating of at least 3 hours." Provide in the EPR design 3 hour rated walls adjacent to outdoor oil–filled transformers that are within 50 ft of building walls or justify the above 2 hour rated fire barriers are acceptable.

09.05.01-58

Response to RAI No.20 for Question 09.05.01-5 stated that "For digital equipment, Regulatory Guide 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants," March 2007, states the following:

"The most effective approach for addressing smoke susceptibility is to minimize the likelihood of smoke exposure by rigorously adhering to the fire protection requirements in 10 CFR 50.48, "Fire Protection," or other individual plant license commitments.

Consistent with this approach, the U.S. EPR computer-based digital control system is channelized with each division housed in a separate Safeguard Building fire area of the plant. In each Safeguard Building, the equipment for each division is located in a benign environment in that the rooms are environmentally controlled and no significant hazards or ignition sources exist. The equipment is considered low voltage. In addition, each area is equipped with early warning detection to recognize a potential fire in its incipient stages, thus allowing the fire brigade to be summoned to extinguish the fire prior to significant development. Consequently, in the unlikely event that a fire occurs any equipment damage in these areas is expected to be minimal and smoke generation negligible."
This approach concentrates on the unlikely event of fire and smoke generation due to fire prevention and detection considerations given above which do mitigate the consequence of a fire in the area where the equipment is located. Discuss in FSAR Section 9.5.1 digital system attributes that would reduce the possibility of spurious actuations such as fiber optic cables, 16 bit digital signals, workstation disable switches, signal recognition outside of Control Room before action is taken, and verification of actions from Control Rooms before actions are taken such that effects of fire and smoke on digital equipment could be precluded.

09.05.01-59

Response to RAI No. 20 for Question 09.05.01-19 stated that "The last sentence in U.S. EPR FSAR Tier 2 ,Section 9.5.1.6 will be changed to: "Implementation of the site-specific fire protection program (FPP) described in part herein will be in accordance with Regulatory Guide 1.189, Regulatory Position 1.1 and is the responsibility of the COL applicant (refer to Section 13.4)." Refer in FSAR Section 9.5.1.6 to all of RG 1.189 Regulatory Position 1, not just subsection 1.1.

09.05.01-60

Response to RAI No. 20 for Question 09.05.01-28 stated that "The reactor coolant pump (RCP) oil collection system was evaluated for inclusion into U.S. EPR FSAR Tier 1 during the development of U.S. EPR FSAR Tier 2, Section 14.3, Tables 14.3-1 through

14.3-7; the level of hazard associated with this system was not considered significant enough for inclusion into Tier 1. Also, the RCP oil collection system is located within the Reactor Containment Building (RCB). As discussed above, divisional separation is safety significant for the U.S. EPR and a fire mitigation feature within the RCB does not need an ITAAC item. Therefore, ITAAC for the RCP oil collection system have not been included in Tier 1." The significance of the fire hazard associated with the RCP lubricating oil system for the current fleet of nuclear plants based on operating experience is such that the oil collection system is a regulatory requirement of 10 CFR Part 50 Appendix R. While Appendix R is not applicable to the EPR design, unless it can be demonstrated that the EPR RCP lube oil systems do not pose a significant fire hazard, include an ITAAC for the RCP oil collection system in the FSAR. Additionally, demonstrate that the RCP oil collection system only affects one division and is not safety significant since all divisions are in containment.

09.05.01-61

Response to RAI No. 20 for Question 09.05.01-35 stated that "A new Section 9.5.1.2.2 will be added to the U.S. EPR FSAR Tier 2, which addresses the alternate compliance entries identified in U.S. EPR FSAR Tier 2, Table 9.5.1-1—Fire Protection Program Compliance with Regulatory Guide 1.189". Confirm in the new FSAR Section 9.5.1.2.2 description for electrical cabinets that plant computer rooms have manually actuated suppression systems and that combustibles and ignition sources in rooms adjacent to the control room will be controlled by administrative procedures as per AREVA's response to question 09.05.01-11. State in the new FSAR Section 9.5.1.2.2 description for the cable spreading room that the sub-floor areas have manually actuated clean agent suppression systems. State in the new FSAR Section 9.5.1.2.2 description for switchgear rooms that these areas have manually actuated suppression systems.

09.05.01-62

The response to RAI No. 20 Supplement 2 for Question 09.05.01-8 provided additional description of plant features to mitigate smoke, hot gases, and fire suppressant migration. This response stated that FSAR Tables 2.1.1-7, 2.1.2-1, and 2.1.2-2 ITAACs will be revised to confirm that barriers that separate redundant divisions are capable of limiting smoke migration to the extent that safe shutdown is not adversely affected as required by SECY-93-087 and SECY 90-016 instead of adding a COL information item to establish provisions for manual smoke control by manual actions of the fire brigade for all plant areas. This response stated that the FSAR allows the use of portable exhaust fan systems and that the fire protection engineer has the responsibility of pre-fire planning which addresses smoke control/removal on a fire area by fire area basis. The staff finds the approach in the above response acceptable with additional FSAR changes stated below. Include the first four paragraphs of the response in the applicable sections of FSAR Section 9.5.1 and document the design. Ensure that all the references given in this response are in the applicable text sections of FSAR Section 9.5.1 and are included in Section 9.5.1.7, References.

09.05.01-63

Response to RAI No. 20 for Question 09.05.01-14 provided a communication summary in FSAR Section 9.5.1.2.1 and modified FSAR Section 9.5.2.2.1 for portable wireless

communication system repeaters, antennas, and interconnecting cables usage. The staff finds the approach in the above response acceptable with additional FSAR changes stated below. FSAR Table 2.4.21-2 ITAAC for communication includes the digital telephone system, the public address and alarm system, and the sound powered system. Include the Portable Wireless Communication System in Table 2.4.21-2. FSAR Table 2.4.21-1, Communication Equipment Locations, does not include SBO Operating Areas which are required for special emergency lighting. Include SBO Operation Areas in Table 2.4.21-1.

09.05.01-64

RG 1.189 Regulatory Position 6.1.2 states that "Peripheral rooms in the control room complex should have automatic water suppression and should be separated from the control room by noncombustible construction with a fire-resistance rating of 1 hour." Section 9.5.1.2.1 does not address the above peripheral room separation from the main control room and Table 9.5.1-1 does not take exception to this separation. However, as per Figure 9.A-23 the peripheral rooms in the control room complex are not separated from the main control room by noncombustible 1 hour fire rated barriers. Provide noncombustible 1 hour fire rated barriers between the peripheral rooms in the control room complex and the main control room.

09.05.01-65

RG 1.189 Regulatory Position 6.1.2 states that "Cables in under-floor and ceiling spaces should meet the separation criteria necessary for fire protection." RG 1.189 Regulatory Position 6.1.2.1 states that "Fully enclosed electrical raceways located in under-floor and ceiling spaces, if over 0.09 m2 (1 ft) in cross-sectional area, should have automatic fire suppression 2 inside. Area automatic fire suppression should be provided for under-floor and ceiling spaces if these spaces are used for cable runs, unless all cable is run in 10-centimeter (4-in.) or smaller steel conduit or the cables are in fully enclosed raceways internally protected by automatic fire suppression." Section 9.5.1.2.1 does not state if the sub-floor areas meets the separation criteria necessary for fire protection as per guidance given in RG 1.189 Regulatory Position 6.1.2. Section 9.5.1.2.1 states that the sub-floor areas which are part of the control room complex are protected with a manually-actuated clean agent fire extinguishing system. Section 9.5.1.2.1 states that having the above manually-actuated system is acceptable since the MCR is occupied at all times while the plant is operating which is not as per the guidance given in RG 1.189 Regulatory Position 6.1.2.1. Provide separation in the sub-floor areas that meets the criteria necessary for fire protection as per guidance given in RG 1.189 Regulatory Position 6.1.2. Provide for a automatic suppression system in the sub-floor areas that is in accordance with RG 1.189 Regulatory Position.