ArevaEPRDCPEm Resource

From: DUNCAN Leslie E (AREVA NP INC) [Leslie.Duncan@areva.com]
Sent: Monday, January 25, 2010 2:54 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 337, FSAR Ch. 9
Attachments: RAI 337 Response US EPR DC.pdf

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 337 Response US EPR DC," provides a schedule since technically correct and complete responses to the nine questions are not provided.

The following table indicates the respective pages in the response document, "RAI 337 Response US EPR DC," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 337 — 09.01.04-14	2	3
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RAI 337 — 09.05.01-74	15	16

A complete answer is not provided for nine of the nine questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 337 — 09.01.04-14	March 19, 2010
RAI 337 — 09.02.02-79	March 19, 2010
RAI 337 — 09.02.02-80	March 19, 2010
RAI 337 — 09.02.02-81	March 19, 2010
RAI 337 — 09.02.02-82	March 19, 2010
RAI 337 — 09.02.02-83	March 19, 2010
RAI 337 — 09.02.02-84	March 19, 2010
RAI 337 — 09.02.02-85	March 19, 2010
RAI 337 — 09.05.01-74	March 1, 2010

Sincerely,

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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, December 15, 2009 7:26 AM
To: ZZ-DL-A-USEPR-DL
Cc: Wheeler, Larry; Tatum, James; McCann, Edward; Segala, John; Lee, Samuel; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 337 (3992, 4018,4110, 4079), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on December 6, 2009, and on December 14, 2009, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs, excluding the time period of **December 25, 2009 thru January 3, 2010, to account for the holiday season** as discussed with AREVA NP Inc. For any RAIs that cannot be answered **within 40 days**, it is expected that a date for receipt of this information will be provided to the staff within the 40-day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 1103

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Response to

Request for Additional Information No. 337 (3992, 4018, 4110, 4079), Revision 1

12/15/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.01.04 - Light Load Handling System (Related to Refueling)
SRP Section: 09.02.02 - Reactor Auxiliary Cooling Water Systems
SRP Section: 09.05.01 - Fire Protection Program

Application Section: FSAR Chapter 9

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

Question 09.01.04-14:

Applicants for standard design certifications are required by 10 CFR 52.47(a)(22) to address operating experience insights. Inspection and Enforcement (IE) Bulletin 84-03, "Refueling Cavity Water Seal," was issued to address the potential failure of refueling cavity seals to assure that fuel uncovery during refueling remains an unlikely event. The bulletin required licensees to evaluate the potential for and consequences of a refueling cavity water seal failure. Additional information concerning refueling cavity seal failures was provided by Information Notice (IN) 84-93, Potential for Loss of Water from the Refueling Cavity." IN 84-93 also noted that refueling cavities can be drained due to failures associated with other seals and as a consequence of valve misalignments. Therefore, in order to adequately address operating experience considerations and in accordance with the requirement specified by 10 CFR 52.47(a)(22), the following additional information is required:

a. Describe the design and installation of the refueling cavity seal and any other seals that will be used and whose failure could cause the refueling cavity to drain.

b. For each of the seals identified in (a), describe measures that will be implemented to ensure that the seals remain intact and do not become degraded over time.

c. For each of the seals identified in (a), evaluate the potential for and consequences of seal failure. These evaluations should address the following considerations:

    1. seal failure modes (including impact by dropped fuel bundles and weld failures) and the maximum leak rate that can occur;

    2. the refueling cavity makeup capability that is assured by Technical Specifications while in Mode 6;

    3. operator actions that are credited, including indication and alarms that are available to alert operators of the problem, and the time needed for operators to complete the required actions assuming that actions are not initiated until ten minutes after an alarm is sounded;

    4. the impact on stored fuel, fuel in transit or otherwise located in the refueling cavity for other reasons, and fuel in the reactor vessel, including the minimum height of water that will remain above the fuel and the basis for this determination; and

    5. the capability to isolate the fuel transfer tube with the maximum radiation level and flow rate of water through the transfer tube that are anticipated as a result of the seal failure.

d. Other than the seals that are referred to in (a), identify all of the paths that are capable of inadvertently draining the refueling cavity, describe controls that will be established to prevent inadvertently draining the refueling cavity through these paths, and evaluate the potential for and consequences of the refueling cavity to drain through these paths (similar to the evaluation referred to in (c).

e. Describe actions that must be taken to restore containment integrity when in Mode 6, the time required to complete these actions, the capability to implement these actions during and/or following situations that cause the refueling cavity to drain, and controls that will be established to ensure that containment integrity can be restored as described.

Revise the Final Safety Analysis Report (FSAR) to adequately describe the licensing basis for the certified plant design with respect to the above considerations. Establish inspections, tests,

analyses, and acceptance criteria (ITAAC), interface requirements, and combined license (COL) action items as appropriate for design features, procedures and controls that are important to ensure that occupational exposures and the release of radioactive material will not exceed NRC requirements as a consequence of inadvertently draining the refueling cavity.

Response to Question 09.01.04-14:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-79:

A. General Design Criteria (GDC) 60 requires nuclear power unit designs to include means to control the release of radioactive materials in gaseous and liquid effluents produced during normal reactor operation, including anticipated operational occurrences. Means must also be provided for monitoring effluent discharge paths and the plant environs for radioactivity that may be released in accordance with GDC 64 requirements. Additionally, 10 CFR 52.47(a)(6) and 10 CFR 20.1406 require applicants for standard plant design certifications to describe the facility design and procedures for operation to minimize contamination of the facility and the environment. In order for the staff to confirm compliance with these requirements, the Final Safety Analysis Report (FSAR) needs to be revised to address the following considerations:

1. The regulatory bases of the seal water system (SEWSS) need to be explained, especially with respect to the above requirements and the role it plays in preventing the spread of radioactive materials. FSAR Tier 2 Section 9.2.7 needs to justify satisfying the above regulations by the system design. Note that Regulatory Guide 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," provides guidance that may be used for addressing the requirements specified by 10 CFR 20.1406. Revise other sections of the Final Safety Analysis Report (FSAR) as appropriate to reflect this information, such as Tier 2 Section 3.1.6, "Criterion 60 – Control of Releases of Radioactive Materials to the Environment."
2. Justify providing SEWSS to pump seals (e.g., provide seal cooling, prevent leakage of radioactive fluid, prevent air in-leakage).
3. Identify any equipment that has continuous seal water leakoff flow, and described the potential for this flow to be contaminated and the prevention of the release of radioactive material by the design.
4. Describe the prevention of the intrusion of radioactive process system water into individual seal water supply lines since system check valves are not shown in the seal water supply to each component in FSAR Tier 2 Figure 9.2.7-1.
5. Describe the capability of the design to detect contamination of the SEWSS and to monitor the release of radioactive material from the SEWSS.
6. Justify the satisfaction of the requirements specified by 10 CFR 20.1406, "Minimization of Contamination by the SEWSS design."
7. Describe the consequences of a loss of SEWSS.

B. Based on the staff's review of RAI 9.2.2-02 (ID1809/6754) AREVA #163 and audit conducted on October 27, 2009, the following were determined as unresolved and need further clarification/resolution by the applicant.

1. Further justification is needed to address means of satisfying the requirements GDC 60 and 10 CFR 20.1406 for the SEWS system. The applicant needs to address, for the case of loss of supply pressure, the potential exists for circulation of radioactive seal leakage between running and non running equipment through common supply piping. The applicant needs to address the design features of the system which minimizes potential contamination of the SEWSS. If a series of check valves are used to prevent

the potential contamination of the system, at the individual radioactive uses, they should be shown on FSAR drawings and adequately described in Tier 2 FSAR Section 9.2.7.

2. Further discussion is needed by the applicant describing the no provisions in the design for detection of potential contamination due to (1) radioactive fluid back leakage into interconnected radwaste area SEWSS supply piping and (2) potential component seal failure due to loss of SEWSS and failure of the non-safety equipment trip interlock. Seal failure could result from loss of seal water and concurrent failure of the non-safety-related equipment trip interlock. Any equipment that remains in operation without seal water would eventually experience seal failure and leakage of contaminated fluid. Additionally, the FSAR should be revised to incorporate a discussion of this scenario. In regard to this scenario, the staff noted the following items for consideration in the response; (1) important components such as chemical and volume control system (CVCS) and severe accident pump seals will continue to be supplied by buffer tanks, and (2) radioactive leakage due to failure of seals on equipment not supported by buffer tanks should be limited to areas with provisions for potential radioactive fluid leakage.

Response to Question 09.02.02-79:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-80:

A. The seal water supply system (SEWSS) description in the Final Safety Analysis Report (FSAR) Tier 2 Section 9.2.7.2 and the Piping and Instrumentation Diagrams (P&IDs) are inaccurate and the FSAR needs to be revised accordingly. In particular, Section 9.2.7.2.2 indicates that the buffer tanks provide a stored volume of seal water to supply the "system users" at sufficient pressure during loss of offsite power (LOOP) conditions. Each buffer tank has a nitrogen gas cushion of sufficient pressure to provide the required seal pressure for any seal water level in the tank. Each buffer tank is protected from excessive nitrogen pressure by a safety valve in the nitrogen supply line. Further in FSAR Section 9.2.7.3.1, "System Operation," states that the valves downstream of the solenoid valves are adjusted and locked in the proper throttled position. Based on a review of FSAR Tier 2 Figure 9.2.7-1 (the SEWSS P&ID), the FSAR needs to be revised to address the following considerations with respect to the buffer tanks:

1. The description in FSAR Section 9.2.7.2.2 implies that the seal water system as a whole can be supplied by the buffer tanks on a LOOP. However, it appears that only a small number of loads are actually supplied by SEWSS during a LOOP, including the chemical and volume control system pump seals in the fuel building (FB) and the Severe Accident Heat Removal pump seals in safeguards building (SB) 4.
2. The safety valves that are described in FSAR Tier 2 Section 9.2.7.2.2, "Buffer Tanks," are not shown on Figure 9.2.7-1.
3. Figure 9.2.7-1 shows a valve downstream of the solenoid operated isolation valve that could be locked in the "throttled position" for only one of the two buffer tanks. The purpose of this valve needs to be described, and an explanation is needed for why a valve is provided for only one of the buffer tanks.
4. A small seal pot is shown on Figure 9.2.7-1 in the level instrumentation for the buffer tank in SB 4 but not on the FB buffer tank. Describe the purpose of this device and explain providing it for only one of the buffer tanks.
5. Related to item 4 above, describe the purpose of the SB 4 buffer tank fill line bypass around the solenoid valve to the tank level instrumentation and confirm that it is not necessary on the FB buffer tank.

B. Based on the staff's review of RAI 9.2.2-04 (ID1809/6756) AREVA #163 and audit conducted on October 27, 2009, the following were determined as unresolved and need further clarification/resolution by the applicant.

1. The applicant's description in FSAR paragraph 9.2.7.2.2 implies that the seal water system as a whole can be supplied by the buffer tanks on a LOOP. However, only a small number of loads were found including the chemical and volume control system (CVCS) pump seals in the fuel building (FB) and the severe accident heat removal pump seals in safeguards building (SB) 4. Clarify the FSAR description in Section 9.2.7.2.2 regarding the functions of the buffer tanks during a LOOP. The applicant's response stated that the buffer tanks provide a stored volume of seal water to the chemical and volume control system pump seals during normal plant operation and LOOP conditions, and to the severe accident heat removal system in the event of a severe accident. While the applicant's response and FSAR markup do clarify that there are a limited number of buffer tank users, the staff found the response significant since it effectively changed the SEWSS function for the CVCS charging pumps from what appeared to be a backup

source of seal water to the only source. Since the CVCS charging pumps may also operate in the post accident period, the staff requests that the applicant revise the response and associated FSAR markups to further clarify that the SEWSS provides CVCS charging pump seal water during all conditions where the pumps can be in service including LOOP.

2. The staff's review of the applicant's response found that FSAR Tier 2 Figure 9.2.7-1 sheet 2 shows manual isolation valves 30GHW44 AA007 and 30GHW45 AA007 in the piping between the buffer tanks and the connection to the nitrogen distribution system. Further the applicant stated that the relief valves were not shown on Figure 9.2.7-1 sheet 2 because they were outside the system (SEWSS) boundary in the gas distribution system. However, pressure relief devices that are isolable from ASME Code vessels that they protect are normally not acceptable. Consequently, the applicant is requested to provide justification in the FSAR for the location of buffer tank relief protection that explains the locations compliance with the design Codes referenced by FSAR Tier 2 Section 9.2.7 (ASME B& PV Code Section VIII Division 1-2004 and ANSI/ASME B31.1-2004) or provide adequate drawings of the nitrogen supply system and its interface with SEWSS.

Response to Question 09.02.02-80:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-81:

A. The seal water supply system (SEWSS) description in the Final Safety Analysis Report (FSAR) Tier 2 Section 9.2.7.3 and the Piping and Instrumentation Diagrams (P&IDs) are inaccurate and the FSAR needs to be revised. In particular, the staff found that the only Charging Pump seal water supply shown in FSAR Tier 2 Figure 9.2.7-1 (the SEWSS P&ID) was connected downstream of the FB buffer tank solenoid isolation valve. However, the description in FSAR section 9.2.7.3 for loss of offsite power (LOOP) indicates that the Charging pump supply from the buffer tank is "normally locked closed." Accordingly, the FSAR needs to be revised to address the following considerations as appropriate:

1. Since the buffer tanks are intended to provide a backup supply of seal water and charging pumps are continuously in service during normal plant operation, describe the normal source and LOOP source of Charging Pump seal water in FSAR Section 9.2.7. This configuration should also be described in FSAR Tier 2 Section 9.3.4 for the chemical and volume control system (CVCS) pump seal water.

2. FSAR Tier 2 Section 9.2.7.6, "Instrumentation Requirements," states "Seal water consumers receive an "off" command on low seal water header pressure." It is not clear if this applies to all users including the CVCS pumps. Describe the basis for his feature and explain if this applies to the normal source of CVCS pump seal water (i.e. a CVCS pump is always in service during normal operation).

3. Describe in the FSAR the consequences if seal water is lost to a CVCS pump (pump seals fail, seal leakage, pump declared inoperable, etc.).

4. Describe in the FSAR the basis for the delay time to manually unlock the buffer tank (CVCS pump in an abnormal condition (e.g. LOOP)). Clarify this in the FSAR.

5. Describe in the FSAR the basis for the operating volume and nitrogen pressure for the buffer tanks.

B. Based on the staff's review of RAI 9.2.2-05 (ID1809/6757) AREVA #163 and audit conducted on October 27, 2009, the following were determined as unresolved and need further clarification/resolution by the applicant. These FSAR discrepancies need to be resolved in order for the staff to fully understand how the SEWSS is designed to control the release of radioactivity and minimize contamination in accordance with GDC 60, "The Control of Release of Radioactive Materials to the Environment," and 10 CFR 20.1406, "Minimization of Contamination."

1. The staff's review of this response and the associated markup of U.S. EPR FSAR Section 9.3.4.2.2, "Component Description," found that the information provided was not sufficient to permit an understanding related to the "off" command features related to the radwaste and CVCS users. The applicant is therefore requested to provide sufficient information in the FSAR response to permit an understanding of the differences for the pump trip function on loss of seal water between the CVCS pumps and radwaste users (e.g. identify different initiating signals). The staff also requests that the applicant revise the FSAR markup to include information relative to the CVCS pump trip on loss of SEWSS in FSAR Tier 2 Sections 9.2.7.6 and 9.3.4.5 entitled "Instrumentation Requirements."

2. The staff reviewed the applicant's response related to the buffer tank and understands that it is sometimes necessary to defer development of certain details until later in the design process. However, basic design detail such as SEWSS buffer tank pressure

and volume are necessary to provide sufficient understanding of the design and operation of the SEWSS system in order for the staff to complete it's evaluation. If these details are unavailable at this time, provide a time line in which this information will become available.

Response to Question 09.02.02-81:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-82:

A. In order to complete its evaluation of the seal water supply system (SEWSS), the staff found that Final Safety Analysis Report (FSAR) Tier 2 Section 9.2.7 needs to be revised to address the following items:

   1. Describe the initiating signals for the pump automatic start described in FSAR Tier 2 Section 9.2.7.

   2. Explain the presence of filters in the SEWSS flow path (Figure 9.2.7-1) for some components and not to others.

   3. Justify the absence of differential pressure instrumentation (not shown on Figure 9.2.7-1).

   4. The basis for the SEWSS pump trip on low demineralized water tank level needs to be explained.

   5. The FSAR states that a reducing valve is provided to protect lower pressure downstream piping. Identify the piping this statement is referring to since it appears that all piping shown on Figure 9.2.7-1 has the same design pressure.

B. Based on the staff's review of RAI 9.2.2-06 (ID1809/6758) AREVA #163 and audit conducted on October 27, 2009, the following were determined as unresolved and need further clarification/resolution by the applicant. These FSAR discrepancies need to be resolved in order for the staff to fully understand the design of the SEWSS for controlling the release of radioactivity and minimize contamination in accordance with GDC 60, "The Control of Release of Radioactive Materials to the Environment," and 10 CFR 20.1406, "Minimization of Contamination."

   1. The staff reviewed the applicant's response and understands that it is sometimes necessary to defer development of certain details until later in the design process. However, design information such as a general description in the FSAR of the basis for pump or system protection features (i.e. initiating signals not specific setpoints) are necessary to provide sufficient understanding of the design and operation of the system in order for the staff to complete it's evaluation. If these details are unavailable at this time, provide a time line in which this information will become available.

   2. The staff review of the applicant's response noted that instead of providing an explanation for some seal water user paths being filtered and others not, the applicant removed the filter from the SEWSS supply to the Radioactive Waste Processing Building. The staff found this response adequate, since it effectively eliminated the inconsistency. However, the staff also found that the associated FSAR markup was not complete in that the filter removed by the applicant from Figure 9.2.7-1 sheet 1 (30GHW46 AT001) was also identified in U.S. EPR FSAR Tier 2 Table 3.2.2-1, which should also be revised. The staff further noted the applicant's response and markup of Figure 9.2.7-1 sheet 2 referred to RAI 9.2.2-6; however, no related changes could be located on this sheet.

   3. The staff review of the applicant's response found the explanation adequate to permit an understanding of pump protective features for the SEWSS. However, the staff requests that the applicant add the explanation with an appropriate technical justification (e.g. to maintain sufficient pump NPSH) to the description in U.S. EPR FSAR Tier 2 Section 9.2.7.6 "Instrumentation Requirements."

Response to Question 09.02.02-82:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-83:

Regulatory Guide (RG) 1.21, “Measuring, Evaluation and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquids and Gaseous Effluents from Light Water Cooled Nuclear Power Plants,” indicates that monitoring should be included for anticipated operational occurrences. Also, 10 CFR 52.47(a)(6) and 10 CFR 20.1406 “Minimization of Contamination” require applicants for standard plant design certifications to describe the means by which the facility design and procedures for operation will minimize contamination of the facility and the environment. Standard Review Plan (SRP) 9.2.2, Areas for Review Section I.10, specifies review of the means provided for detecting leakage of radioactivity from one system to another and for precluding its release to the environment. The staff noted that FSAR Tier 2 Section 9.2.2.6 indicates that radiation monitors are provided in a recirculation line for the component cooling water system (CCWS) heat exchanges, part of the thermal barrier piping discharge, and in the return path from the high pressure (HP) chemical and volume control system (CVCS) and coolers inside containment. Furthermore, the applicant stated in FSAR Section 9.2.2.6.1 that automatic isolation is provided (i.e. both CCWS and CVCS) in case of a reactor coolant system (RCS) fluid leak into the CCWS from the HP CVCS cooler that results in a high radiation signal. The CCW heat exchanger recirculation line radiation instrument provides continuous monitoring. The staff found that the following considerations need to be addressed in the FSAR:

Each divisional CCWS surge tank has a 4” overflow line as shown on Figure 9.2.2-1. This overflow is not clearly shown on this figure as to the interface or location of the continuation of the system except for the funnel as referenced from EPR FSAR Figure 1.7-1 “P&ID Symbols Legend”. In the event the CCWS becomes contaminated due to system leakage by interfacing systems such as the LHSI heat exchanger, the location of the CCWS overflow water needs to be clearly described in the FSAR.

Response to Question 09.02.02-83:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-84:

Follow-up to RAI 174, Question 9.2.2-30 (c)

Regulatory Guide (RG) 1.21, "Measuring, Evaluation and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquids and Gaseous Effluents from Light Water Cooled Nuclear Power Plants," indicates that monitoring should be included for anticipated operational occurrences. Standard Review Plan (SRP) 9.2.2, Areas for Review Section I.10, specifies review of the means provided for detecting leakage of radioactivity from one system to another and for precluding its release to the environment. The staff noted that FSAR Tier 2 Section 9.2.2.6 indicates that radiation monitors are provided in a recirculation line for the component cooling water system (CCWS) heat exchanges, part of the thermal barrier piping discharge, and in the return path from the high pressure (HP) chemical and volume control system (CVCS) and coolers inside containment. Furthermore, the applicant stated in FSAR Section 9.2.2.6.1 that automatic isolation is provided (i.e. both CCWS and CVCS) in case of a reactor coolant system (RCS) fluid leak into the CWCS from the HP CVCS cooler that results in a high radiation signal. The CCW heat exchanger recirculation line radiation instrument provides continuous monitoring. The staff found that the following considerations need to be addressed in the FSAR:

C. FSAR Tier 2 Section 9.2.2.6.1 states that "detection of increasing radiation in the CCW from the CVCS HP coolers indicates leakage and prompts the isolation of both fluids (CCWS and CVCS)." In contrast the applicant's response and FSAR markup of Tier 2 Section 9.2.2.3.1 only identify CVCS valves that are automatically closed on a high radiation signal. Therefore the applicant is requested to revise the FSAR markup to identify both the CCWS and CVCS valves that are automatically isolated and to include both Sections 9.2.2.3.1 and 9.2.2.6.1. Alternatively, the applicant must provide technical justification that supports elimination of the automatic isolation for CCWS as currently described in FSAR Tier 2 Section 9.2.2.6.1.

Response to Question 09.02.02-84:

A response to this question will be provided by March 19, 2010.

Question 09.02.02-85:

Follow-up to RAI 176, Question 14.02-92

Many important design parameters remain unavailable in FSAR Tier 2 Section 9.2.2. For example, acceptance criteria in paragraph 5.1.2 of procedure 046 require that CCW system flow rates must be within design limits. Design flow rates are not identified in FSAR Tier 2 Section 9.2.2 for many flow paths including some important ones such as: (a) Low head safety injection and residual heat removal (LHSI/RHR) pump coolers (trains 2 and 3), (b) Medium head safety injection (MHSI) pump coolers, (c) CCWS pump motor coolers, (d) Emergency surge tank makeup capability, (e) Chemical and volume control system (CVCS) high pressure cooler (containment) and (f) CVCS pump coolers, (g) RCP motor bearing coolers etc. For these reasons, the applicant should provide this information in the Chapter 9 of the FSAR.

Response to Question 09.02.02-85:

A response to this question will be provided by March 19, 2010.

Question 09.05.01-74:

The applicant's RAI 09.05.01-61 response stated that U.S. EPR FSAR Section 9.5.1.2.2 will be updated for MCR under-floor areas as follows:

"Generally, the control room complex complies with RG 1.189, Regulatory Positions 6.1.2 and 6.1.2.1. Alternative compliance is provided because of the lack of automatic water suppression for the MCR under-floor areas.

Having the suppression system for the MCR sub-floor being manually actuated instead of automatically actuated is acceptable based on the MCR being manned at all times the plant is operating, and the relatively small volume of the sub-floor area, which provides reasonable assurance so that the quantity and location of ionization type fire detectors in the sub-floor area will provide early warning for timely response by MCR personnel."

The applicant's RAI 09.05.01-65 response stated that fixed fire suppression capability in the form of a clean agent (gaseous) fire extinguishing system is provided for the MCR sub-floor area based on the considerations of R.G. 1.189, Regulatory Position 6.1.2.1. However, to preclude concerns regarding inadvertent activation of this fire extinguishing system, clean agent gas release will be via local hand switch actuation by MCR operators, in lieu of automatic release by activation of the fire detection system.

Tier 1 Table 2.7.6-1, "Gaseous Fire Extinguishing System ITAAC", specifies that the GFES will deliver the concentration of suppression agent required to extinguish a fire for the specific suppression agent selected within 10 minutes and that the GFES will maintain the required suppression agent concentration for the required soak time of 15 minutes.

NFPA 2001, "Standard on Clean Agent Fire Extinguishing Systems", Section A.5.4.2.4 states that deep-seated fires involving Class A fuels can require substantially higher design concentrations and extended holding times than the design concentrations and holding times required for surface-type fires involving Class A fuels. Hazards containing both Class A and Class B fuels should be evaluated on the basis of the fuel requiring the highest design concentration. Annex A provides guidance to determine minimum extinguishing concentration for Class A surface fires by meeting the following conditions in part: all visible flame extinguished within 600 seconds and no ignition of the fuel at the end of the 600 second soak time and subsequent test compartment ventilation.

The staff finds that the use of ionization type fire detectors will not provide sufficient early warning to preclude having deep-seated fires that would require substantially higher holding times. The staff also finds that there may not be a ITAAC related to holding time or discharge time and that there may be confusion between soak time and holding time. Therefore, the staff finds that the above ITAAC acceptance criteria may not be adequate or sufficient and that manual actuation relying on ionization detection may not be acceptable. The applicant needs to provide automatic suppression or incipient detection to preclude deep-seated fires or provide additional details for justifying manual suppression with ionization detection for deep-seated fires and detail the concerns regarding inadvertent activation of this fire extinguishing system. The applicant also need to clarify and provide the bases for ITAAC acceptance criteria with respect to extinguishing time and soak time and to add ITAACs for holding time and delivery time as applicable.

Response to Question 09.05.01-74:

A response to this question will be provided by March 1, 2010.