ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Friday, April 24, 2009 4:14 PM
To: Getachew Tesfaye
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. 200, FSAR Ch. 9
Attachments: RAI 200 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 200 Response US EPR DC.pdf" provides a technically correct and complete response to 5 of the 6 questions.

The following table indicates the respective pages in the response document, "RAI 200 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 200 — 09.01.01-18	2	2
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A complete answer is not provided for 1 of the 6 questions. The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 200 — 09.01.01-18	June 5, 2009

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
Lynchburg, VA 24506-0935
Phone: 434-832-3694
Cell: 434-841-8788

From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, March 25, 2009 7:55 AM
To: ZZ-DL-A-USEPR-DL
Cc: Jeffrey Poehler; David Terao; Gerard Purciarello; Steven Bloom; John Segala; Peter Hearn; Joseph Colaccino;

ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 200 (2280, 2282,2267), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on March 6, 2009, and discussed with your staff on March 23, 2009. No changes were made to the Draft RAI Questions as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 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: 430

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Created By: Ronda.Pederson@areva.com

Recipients:
"BENNETT Kathy A (OFR) (AREVA NP INC)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen V (AREVA NP INC)" <Karen.Delano@areva.com>
Tracking Status: None
"KOWALSKI David J (AREVA NP INC)" <David.Kowalski@areva.com>
Tracking Status: None
"Getachew Tesfaye" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

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Response to

Request for Additional Information No. 200 (2280, 2282, 2267), Revision 0

3/25/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.01.01 - Criticality Safety of Fresh and Spent Fuel Storage and Handling
SRP Section: 09.03.04 - Chemical and Volume Control System (PWR) (Including Boron Recovery System)
SRP Section: 09.05.04 - Emergency Diesel Engine Fuel Oil Storage and Transfer System
Application Section: 9.5.4

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)
QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

Question 09.01.01-18:

Background

On page 100/127 of the technical report on Metamic that was completed for Holtec (Reference 1), the following statement was provided as justification for no additional testing:

"Radiation and an aqueous environment do not couple to produce a synergistic effect on the corrosion of metals. The use of aluminum and other metals in wet, high-radiation environments for many years (in reactors, fuel storage facilities, test cells, etc.) has shown the corrosion behaviors of the metals are not affected by radiation. Consequently, no corrosion tests were performed on the Metamic samples following their irradiation, and no tests are planned. Radiation has no effect on the corrosion rate of Metamic."

However, no testing has been performed on Metamic in the specific conditions cited in the original RAI (simultaneous exposure to radiation, peroxide and sulfates in a boric acid solution).

Requested Information

Provide data from the other metallic, neutron-absorber materials that have been in-service (cited in the Metamic report) that supports the assertion that Metamic will not be degraded under conditions of radiation fields (dose rates at the surface of the Metamic when faced with freshly-discharged spent fuel) and chemistry experienced at US PWRs (2800 ppm boric acid, 5 ppm peroxide, 150 ppm sulfates, up to 1 ppm of silica).

References

I. Holtec proprietary report, HI-2043215, Rev. 2, "Sourcebook for Metamic Performance Assessment," Attachment 7 to Letter from Tammy Morin to USNRC dated August 3, 2007, Subject: Response to Request for Additional Information (RAI) on License Amendment Request (LAR) 9261-5 to HI-STAR 100 Certificate of Compliance (CoC) No. ; ADAMS Accession No. ML072550049

Response to Question 09.01.01-18:

A response to this question will be provided by June 5, 2009.

Question 09.03.04-19:

Background

RAI 09.03.04-16 provided the following background:

Technical Specification 3.4.15 limits the specific reactor coolant activity for Dose Equivalent ^{131}I and Dose Equivalent ^{133}Xe. These are fuel integrity monitoring parameters. If RCS oxygen is not adequately controlled by having significant enough hydrogen concentrations, the fuel integrity cannot be assured. Control of hydrogen in PWRs is usually performed by 100% of letdown flow through the volume control tank (VCT). The VCT is maintained under hydrogen pressure (only) between 20 and 35 psig. The design identified in the FSAR has a significantly different approach to hydrogen control, that it is not well described.

RAI 09.03.04-16 requested the following information:

1. Provide the equations that identify the flow and concentration of hydrogen into the RCS liquid from the letdown system gassifier and VCT.

2. Justify the letdown flow of only 10% being directed through the VCT.

3. In order to assess the concentration of hydrogen in the RCS, the mole fraction of hydrogen in the VCT gas phase must be known. A sample line from the VCT gas space does not appear in the plant design for the NSS. Provide the methodology for determining the %H2 in the VCT gas phase so that the RCS hydrogen in cc/Kg can be properly calculated.

The response to RAI 09.03.04-16, Questions 1-3, can be summarized as follows:

1. The means of calculating the theoretical hydrogen concentration in the RCS will be provided at a later time in the design process.

2. The basis for directing only ten percent of the letdown flow through the VCT is to maintain the boron concentration in the tank in chemical equilibrium with the RCS. (the staff's intent with this question was for the applicant to justify the specific percentage of the letdown flow directed to the VCT)

3. Nitrogen gas will be used to control the VCT gas space pressure and the hydrogen concentration. The RCS hydrogen concentration will be measured using a pressurized RCS sample.

However, the applicant's response raises some additional concerns:

Since the method of controlling hydrogen proposed for the EPR is essentially a new design, in that operating PWR's typically maintain a hydrogen overpressure only on the VCT, as opposed to a nitrogen overpressure as proposed by the applicant, and typically route 100% of letdown flow through the VCT compared to 10% proposed by the applicant, the staff requires more detail for this design in order to obtain reasonable assurance that the design will perform its intended function.

Helium has the potential to introduce inaccuracy into the calculation of theoretical reactor coolant hydrogen concentration (the theoretical reactor coolant hydrogen concentration is compared to the measured reactor coolant hydrogen concentration and theoretical concentration should typically be within 10% of the measured concentration). Helium is formed as a result of $^{10}B(n,\alpha)^{7}Li$ reactions that occur in the RCS. The alpha particles are simply helium atoms and gain their electrons via interaction with water molecules. Helium is also a fission product. No means to sample the VCT gas space for hydrogen was provided. Measurement of hydrogen in the gas phase is typically performed so that a correction for the helium can be performed in the theoretical hydrogen calculation.

Additionally, the diversion of only 10% of the letdown flow to the VCT (as compared to some higher percentage) was not justified by the applicant.

Finally, a byproduct of the use of nitrogen to control the VCT pressure could be the formation of ammonia in the core when hydrogen and nitrogen gases undergo radiolysis to form free radicals. These free radicals will combine to form ammonia. The higher the concentration of nitrogen the higher will be the concentration of ammonia. This reaction will also limit the available hydrogen in the RCS.

<u>Requested Information</u>

1. Describe the design of the letdown system “gas-separator” that will provide hydrogen control to the RCS and provide the actual equations to be used in the calculations in terms of measurable plant parameters that will allow the theoretical hydrogen concentration to be calculated.

2. With only 10% of the letdown flow going through the VCT,

   a) Provide the duration it will take to ensure that equilibrium in the RCS is established after a change in the hydrogen injection rate based on the theoretical calculations made on RCS hydrogen.

   b) Provide engineering details and calculations that show the details of establishment of the equilibration with the RCS.

3. If VCT pressure is controlled using nitrogen gas:

   a) Provide the mechanism for preventing the build up of helium in the VCT, and describe the compensation for the interference from helium in the analysis of hydrogen.

   b) The use of nitrogen gas will saturate the RCS with nitrogen.

      I. Provide the projected ammonia concentration in the RCS for this model.

      II. Provide calculations for determining this concentration and describe this concentration's affect on the demineralizer performance for removal of cations.

Response to Question 09.03.04-19:

1. The hydrogenation station is shown on U.S. EPR FSAR Tier 2, Figure 9.3.4-1—Chemical and Volume Control System, Sheet 3 of 9 and consists of the following:

    - Mixing pipe, where entrained hydrogen is mixed with the letdown stream.
    - Gas separator, where hydrogen gas is added to the system and where hydrogen bubbles are separated from the letdown stream.
    - Stand pipe, which monitors the water level in the gas separator.
    - Water jet pump, which educts hydrogen gas from the gas separator and entrains the gas into the letdown stream.

    This system, which is used to add hydrogen to the reactor coolant system (RCS), has been successfully implemented in several European PWR plants (e.g., the standard 4-loop units Grafenrheinfeld, Grohnde, Philippsburg 2 and Brokdorf; the standard 4-loop Konvoi units Isar 2, Emsland and Neckarwestheim 2; and the 3-loop unit Trillo (Spain)). *Reference: An Evaluation of Enriched Boric Acid in European PWRs, EPRI, Palo Alto, CA: 2001, EPRI Report 1003124.*

    The gas separator is designed with a tangential inlet nozzle which imparts a rotational motion to the reactor coolant letdown entering the separator. This centrifugal motion is maintained by the tangential outlet nozzle. This rotational flow results in the separation of undissolved hydrogen. The hydrogen is collected in the top head of the gas separator and educted by the water jet pump and discharged into the letdown stream. The RCS hydrogen concentration depends on the hydrogen partial pressure in the gas separator and the back pressure applied to the gas by the over pressure maintained in the Volume Control Tank.

2.

    a. The means for predicting the time to reach equilibrium in the RCS after a change in the hydrogen injection rate will not be available until later in the design process.

    b. Water flow through the Volume Control Tank consists of approximately 10 percent of the letdown flow and the Reactor Coolant Pump #1 seal leak-off return. The combined flow during normal operating conditions is approximately 28 gallons per minute. The normal operating liquid volume in the VCT is approximately 2800 gallons. Therefore, it will take approximately 100 minutes to change one volume in the VCT. Assuming five volume changes are required to reach an equilibrium condition, it requires 500 minutes or 8.3 hours to reach equilibrium.

3.

    a. The overpressure maintained on the VCT is provided by nitrogen from the waste gas processing system. The continuous flow of nitrogen through the VCT limits the buildup of helium in the VCT.

b. The equilibrium concentration of ammonia in the RCS and effect on demineralizer performance will be identified later in the design process.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 09.03.04-20:

Background

RAI 09.03.04-17 provided the following background:

Technical Specification 3.4.5 identifies the operational requirements for assuring that the boron concentration is “not diluted.” GDC 29 also identifies a function of Chemical and Volume Control System (CVCS) as supplying boric acid solution reliably for negative reactivity in the Reactor Coolant System (RCS). This requirement concerns both the total boron and the specific atom % of B-10. The coolant treatment system (CTS) as described in FSAR Tier 2 Section 9.3.4.2 (and accompanying figures 9.3.4-6) uses evaporative techniques to separate pure water from concentrated boric acid solution. The evaporator feed is purified through a demineralizer and then sent to an evaporator where the water is distilled through a series of trays to ‘purify’ the distillate removing additional boric acid. Concentration of contaminants in the boric acid phase, such as chlorides, silica, sulfate and sodium, and difficulty in maintaining flow continuity at higher boron concentrations and temperatures due to boric acid insolubility at high concentrations, have caused all plants to abandon operations of these systems for recycle purposes. Am/Be neutron sources and their associated BF3 detectors have been difficult to maintain in the past and most plants have removed these systems from their letdown lines.

The staff requires additional information related to the responses to RAI 09.03.04-17, Questions 1and 6.

1. Question 1 requested that the applicant provide additional details regarding the ‘trays’ in the boron evaporator and their physical functionality (e.g., percent boron removed for each tray).

   The response to Question 1 stated that the boron evaporator design is of a proprietary nature and may vary from the original design but will function to produce water of appropriate quality for re-use in the plant. Since the design details cannot be supplied to the staff at this time, the staff requires an alternate means to obtain assurance of the system’s functionality, such as a pre-operational test.

6. Question 6 requested that the applicant provide the methodology for the determination of the B-10 concentration (atom %) in the recycled boric acid and provide the frequency of that determination.

   The response to Question 6 stated that the relative abundance of the B-10 and B-11 isotopes can be determined using mass spectrometry. Acceptable methods include glow discharge mass spectrometry (GDMS), thermal ionization mass spectrometry (TIMS), secondary ion mass spectrometry (SIMS), and inductively coupled plasma mass spectrometry (ICP-MS). The minimum frequency for the isotope abundance determination is once per year. However, the staff is concerned that the boric acid could become depleted in B-10 due to the long interval between determinations of the isotope abundance.

Requested Information

1. For the boron evaporator, provide a pre-operational functional test with acceptance criteria in FSAR Chapter 14 that will confirm the acceptability of this system's performance.

6. Provide a calculation that demonstrates the EBA concentration in the stored tanks will not be depleted in B-10 over the course of a one year interval of sampling and analysis, so that this stored water can readily be used for neutron control during power operation.

Response to Question 09.03.04-20:

1. The coolant treatment system (CTS) is a non-safety-related system and its failure does not impact the function of any system important to safety. Therefore, providing pre-operational functional testing and associated acceptance criteria in U.S. EPR FSAR Chapter 14 is beyond the regulatory requirements for confirming the acceptability of a non-safety-related system's performance. Specific details on the CTS Boric Acid Column/Evaporator operation are integral to the equipment manufacturers' final design and on-going detailed design engineering activities. Information on the final equipment performance meeting the required design specification requirements (e.g., final boron solution and demineralized water concentrations (ppm)) will be requested as part of the supplier's functional shop testing (or equivalent) prior to owner equipment acceptance and release for shipment (to the site).

6. The frequency for determining the B-10 assay (atom %) will be identified later in the design process.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 09.05.04-17:

Background

GDC 17 requires an independent and redundant onsite electric power system for the functioning of SSCs important to safety. RG 1.137 provides the regulatory position on diesel engine fuel oil quality as it relates to GDC 17. FSAR Tier 2 Section 9.5.4.3.1 commits to meeting new fuel-quality guidelines of RG 1.137. Position C.2.a of RG 1.137 recommends the cloud point to be less than or equal to the 3-hour minimum soak temperature or the minimum temperature at which the fuel oil is stored. The Diesel Fuel Oil Testing Program does not specify a minimum cloud point temperature even though the main tank room of the Emergency Power Generating Building (EPGB) has a design minimum temperature of 15°C (59°F) (FSAR Tier 2 Section 9.4.9.1). In addition, NRC Information Notice 94-19 *Emergency Diesel Generator Vulnerability to Failure from Cold Fuel Oil* clearly stresses the importance of specifying the proper cloud point. In RAI 9.5.4-1 dated 10/3/08, the applicant was requested to specify the minimum cloud point for the Diesel Fuel Oil Testing Program. The applicant replied to RAI 9.5.4-1 in its response to Request for Additional Information (RAI) Number 86, dated 11/3/08. The applicant stated the fuel oil cloud point is only a concern during extreme cold weather operations and the diesel fuel oil for the U.S. EPR is stored indoors. As such, cold weather degradation of fuel oil is not a concern.

The staff does not completely agree with the response and finds the cloud point needs to be specified when purchasing Diesel Fuel Oil especially during cold weather. Although the fuel is stored in a heated room, when it is delivered it may sit in a truck outdoors for long periods of time. An improperly specified cloud point may result in the inability to sample or offload the truck. In this case, the cloud point should be based on the minimum expected ambient temperature, which would necessitate a COL item for the COL applicant to specify the cold weather cloud point.

Requested Information

Please include a COL item for the COL applicant to specify the cloud point of the diesel fuel oil.

Response to Question 09.05.04-17:

U.S. EPR FSAR Tier 2, Section 1.8 addresses the requirements of 10 CFR 52.47(a)(25) and describes the standard plant scope interfaces for the U.S. EPR as they relate to design certification between the standard U.S. EPR plant and the COL applicant. The site-specific items that must be included by a COL applicant that references the U.S. EPR design certification are also provided in this section.

Interface requirements for structures, systems and components (SSC) that relate to specific mechanical, electrical, nuclear or structural systems are covered in the appropriate chapter and identified by a specific COL information item to be addressed by the applicant. A COL applicant that references the U.S. EPR design certification will describe where the interface requirements are satisfied in the COL Final Safety Analysis Report (FSAR) to demonstrate compatibility with the U.S. EPR design.

Table 1.8-2—U.S. EPR Combined License Information Items, lists the COL information items and the section where the information is discussed. A COL applicant that references the U.S.

EPR design certification will identify the FSAR section, or provide a list, that demonstrates how the COL information items have been addressed. The applicable FSAR sections and Table 1.8-2 also identify where an activity required by a COL information item requires as-built information or other conditions that are not available when the COL application is submitted. These activities are completed prior to fuel load.

Requirements for information regarding the purchasing requirements for diesel fuel oil would be addressed as part of Item 13.5-1:

> "A COL applicant that references the U.S. EPR design certification will provide site-specific information for administrative, operating, emergency, maintenance and other operating procedures."

It is noted, for example, that Revision 3 of the CCNPP Unit 3 COLA states:

> 13.5.2.2.8 Material Control Procedures
>
> "These procedures shall address the proper procurement, documentation, and control of materials and components to ensure that only correct and accepted items (consumables, items with limited shelf life, materials, parts, and components, including partially fabricated assemblies) are used or installed. These procedures shall be sufficiently detailed to ensure that materials and components are purchased and handled in a controlled manner with the QAPD."

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 09.05.04-18:

Background

RG 1.137 Position C.2.e recommends the draining of accumulated condensate from day tanks monthly, it is not clear in the application if Surveillance Requirement SR 3.8.3.5 (drain condensate from storage tanks every 92 days) applies to the day tanks; however, the frequency exceeds that recommended by RG 1.137. In RAI 9.5.4-5 dated 10/3/08, the applicant was requested to Identify the surveillance requirement that drains accumulated water from the day tanks.

Provide justification for exceeding the RG 1.137 recommended surveillance requirement frequency of 30 days.

The applicant replied to RAI 9.5.4-1 in its response to Request for Additional Information (RAI) Number 86, dated 11/3/08. The applicant stated that Surveillance Requirement SR 3.8.3.5 is also applicable to the day tanks, however, the applicant did not provide justification for extending the interval. Technical Specification Bases for SR 3.8.3.5 states the surveillance frequency is established by RG 1.137.

Requested Information

The applicant is requested to provide justification for exceeding the recommended frequency for draining condensate from the day tanks.

Response to Question 09.05.04-18:

As stated in Regulatory Guide 1.137, Revision 1, Fuel-Oil Systems for Standby Diesel Generators, dated October 1979, Regulatory Position C.2.d:

> “Accumulated condensate should be removed from storage tanks on a quarterly basis or on a monthly basis when it is suspected or known that the groundwater table is equal to or higher than the bottom of buried storage tanks.”

As discussed in U.S. EPR FSAR Tier 2, Section 9.5.4.2, the diesel generator fuel oil storage and transfer system (DGFOSTS) is located in the Class I Emergency Power Generating Building (EPGB). The oil fill connection to the storage tank is located above grade and includes a locked closed valve. This arrangement minimizes the opportunity for water intrusion into the fuel oil storage tank from groundwater or rainwater. Hence, surveillance of the fuel oil storage tank on a quarterly basis is appropriate.

As discussed in the Bases for Surveillance Requirement 3.8.3.3:

> “The tests listed below are a means of determining whether the new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion.”

> “c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-2004 E2005 (Ref. 6) or a water and

sediment content within limits when tested in accordance with ASTM D2709-1996 R2006 (Ref. 6)."

This requirement minimizes the opportunity for water intrusion into the fuel oil storage tank during the replenishment of fuel oil.

As discussed in U.S. EPR FSAR Tier 2, Section 9.4.9.1, the emergency power generating building ventilation system (EPGBVS) maintains acceptable ambient conditions and air renewals of the diesel hall, electrical room and main tank room of each of the four divisions of the EPGB. The EPGBVS is designed to meet the following functional criteria:

- Maintain the diesel hall temperature between 59°F and 140°F.
- Maintain the electrical room temperature between 59°F and 95°F, with 35 to 70 percent relative humidity.
- Maintain the main tank room temperature between 59°F and 140°F.

These requirements minimize the opportunity for water intrusion into the fuel oil storage tank or day tank due to condensation.

Fill lines and transfer pump suction lines to the day tank are located above the fuel oil storage tank sump to preclude disturbance of sediment or water which might lead to the introduction of contaminants into the fuel oil system.

As discussed in the Standard Technical Specifications for Westinghouse Plants (NUREG-1431) for Surveillance Requirement (SR) 3.8.3.5, the presence of water does not necessarily represent failure of the SR. Therefore, the presence of water does not render the diesel generator inoperable.

In summary:

- Surveillance of the fuel oil storage tank on a quarterly basis is appropriate.
- Actions have been taken to minimize the opportunity for water intrusion into the fuel oil storage tank during the replenishment of fuel oil.
- Actions have been taken to minimize the opportunity for water intrusion into the fuel oil storage tank or day tank due to condensation.
- Fill lines and transfer pump suction lines to the day tank are located above the fuel oil storage tank sump to preclude disturbance of sediment or water which might lead to the introduction of contaminants into the fuel oil system.
- The presence of water does not render the diesel generator inoperable.

Therefore, surveillance of the fuel oil day tank on a quarterly basis is appropriate.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 09.05.04-19:

General Design Criteria 2 requires that structures, systems, and components (SSC) important to safety be protected from natural phenomena, including earthquakes. Although the diesel generator fuel oil storage and transfer system (DGFOSTS) is seismic category I and is located in a seismic category I building, the applicant did not state that the non seismic category I SSCs in the Emergency Power Generation Building (EPGB) will have no adverse effect on the DGFOSTS after a safe shutdown earthquake (SSE) Explain the effect of non seismic category I SSCs in the EPGB upon the DGFOSTS after an SSE.

The FSAR should be changed to reflect this information.

[Note: This question was suppose to be part of RAI 152 (1720) Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)]

Response to Question 09.05.04-19:

Non-Seismic Category I structures, systems and components (SSC) in the Emergency Power Generating Building (EPGB) will have no deleterious effect on the safety-related function of safety-related Seismic Category I components of the diesel generator fuel oil storage and transfer system (DGFOSTS) after an safe shutdown earthquake (SSE).

U.S. EPR seismic design category classification is addressed in U.S. EPR FSAR Tier 2, Section 3.2.1. The seismic design classification of the non-safety-related equipment or structures that are located in the vicinity of the DGFOSTS is provided in U.S. EPR FSAR Tier 2, Table 3.2.2-1—Classification Summary. U.S. EPR seismic design category classifications are consistent with the guidance provided in SRP 3.2.1 (refer to the response to RAI 71, Question 03.02.01-1, for further details of the methodology for classifying SSC). The consequences of the failure of non-safety-related equipment or structures not designed to Seismic Category I criteria on safety-related, Seismic Category I components of the DGFOSTS is reflected in the classification summary table in U.S. EPR FSAR Tier 2, Table 3.2.2-1.

Designation of a particular non-safety-related component as Seismic Category II (as addressed in U.S. EPR FSAR Tier 2, Section 3.2.1) is dependent on the potential failure modes and consequences of that component, the proximity of Seismic Category I/safety-related components, and the vulnerability of those components to the consequences of the failure mode of the particular non-safety-related component in question. Seismic Category II SSC are designed and constructed so that the SSE does not cause them to fail in a manner that is deleterious to the safety-related functioning of any safety-related Seismic Category I SSC, in conformance to RG 1.29 Rev 4 regulatory position C.2.

Non-seismic lines and associated equipment are routed, to the extent possible, outside of safety-related structures and areas to avoid potentially adverse interactions. In the event that this routing is not possible and non-seismic lines must be routed in safety-related areas, the non-seismic items are evaluated for seismic interactions (refer to U.S. EPR Tier 2, Section 3.7.3.8).

Since the requested information is contained within the seismic classification definitions in U.S. EPR FSAR Tier 2, Section 3.2.1, no change to the U.S. EPR FSAR is required.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.