ArevaEPRDCPEm Resource

From: BRYAN Martin (EXT) [Martin.Bryan.ext@areva.com]
Sent: Monday, March 01, 2010 1:23 PM
To: Tesfaye, Getachew
Cc: DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); ROMINE Judy (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 332, FSAR Ch. 5 OPEN ITEM
Attachments: RAI 332 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 332 Response US EPR DC.pdf" provides technically correct and complete responses to the questions.

The following table indicates the respective pages in the response document, "RAI 332 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 332 — 05.02.02-11	2	2
RAI 332 — 05.02.02-12	3	3

This concludes the formal AREVA NP response to RAI 332, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Martin (Marty) C. Bryan
Licensing Advisory Engineer
AREVA NP Inc.
Tel: (434) 832-3016
Martin.Bryan@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, December 18, 2009 8:57 AM
To: ZZ-DL-A-USEPR-DL
Cc: Budzynski, John; VanWert, Christopher; Donoghue, Joseph; Roy, Tarun; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 332 (4047), FSARCh. 5 OPEN ITEM

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on November 18, 2009, and discussed with your staff on December 17, 2009. No changes were made to the draft RAI questions as a result of that discussion. The questions in this RAI are OPEN ITEMS in the safety evaluation report for Chapter 5 for Phases 2 and 3 reviews. As such, the schedule we have established for your application assumes technically correct and complete responses prior to the start of Phase 4 review. For any RAI that cannot be answered prior to the start of Phase 4 review, it is expected that a date for receipt of this information will be provided so that the staff can assess how this information will impact the published schedule.

Thanks,

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

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 1194

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Subject: Response to U.S. EPR Design Certification Application RAI No. 332, FSAR Ch. 5 OPEN ITEM
Sent Date: 3/1/2010 1:23:16 PM
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From: BRYAN Martin (EXT)

Created By: Martin.Bryan.ext@areva.com

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MESSAGE	2078	3/1/2010 1:23:18 PM
RAI 332 Response US EPR DC.pdf	63692	

Options
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Reply Requested: No
Sensitivity: Normal
Expiration Date:
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Response to

Request for Additional Information No. 332 (4047), Revision 0

12/18/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 05.02.02 - Overpressure Protection
Application Section: Chapter 5

QUESTIONS for Reactor System, Nuclear Performance and Code Review (SRSB)

Question 05.02.02-11:

OPEN ITEM

In it's response to RAI 5.2.2-3, the applicant indicated that the LTOP transient analysis used RELAP5/MOD2-B&W to model the U.S. EPR nuclear steam supply system (NSSS) using the methodology in BAW-10169P-A, B&W Safety Analysis Methodology for Recirculating Steam Generator Plants (BAW-10169P-A, "B&W Safety Analysis Methodology for Recirculating Steam Generator Plants," B&W Fuel Company, October 1989.) Provide the reference or other basis demonstrating NRC approval to use the B&W methods for the LTOP transient analysis of the US EPR design?

Response to Question 05.02.02-11:

AREVA NP submitted Topical Report ANP-10263P, "Codes and Methods Applicability Report for the U.S. EPR" to the NRC in August 2006. The NRC approved this Topical Report in August 2007. Topical Report ANP-10263P-A states that the U.S. EPR is an evolutionary pressurized water reactor (PWR) design and retains the principal features of existing four-loop plants and fuel designs. Although not explicitly discussed in Topical Report ANP-10263P-A, justifications regarding the plant configuration are applicable to low temperature overpressure protection (LTOP). The key phenomenon in LTOP analyses is the compressibility of water as an additional source of water (e.g., safety injection) that is introduced to an already water solid reactor coolant system. These key models have not changed in RELAP since the code was first approved by the NRC. The current LTOP methods approved by the NRC for existing plants remain applicable to the U.S. EPR.

FSAR Impact:

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

Question 05.02.02-12:

OPEN ITEM

It was noted that the inlet to the PSRVs and PDS valves have water loop seals. EPR DCD Section 3.9.3.2.1 was reviewed and the staff was unable to identify any reference or discussion with respect to an analysis of the dynamic loads developed by the loop seals. The staff evaluated loop seal dynamic loading extensively in NUREG 0737 work performed in the 1980's and found that the dynamic loads caused by loop seals were very significant. Provide a reference or discussion of the analysis performed that adequately evaluated for the forces created in the loop seals during the discharge of the safety valves.

Response to Question 05.02.02-12:

The dynamic loads developed by water in the upstream loop seals are part of the fluid transient analyses of ASME Class 1 piping as described in Topical Report ANP-10264NP-A, "U.S. EPR Piping Analysis and Piping Support Design," Table 3-1—Load Combinations and Acceptance Criteria for ASME Class 1 Piping.

Forces created in the loop seals during discharge of safety valves are evaluated by considering lessons learned from NUREG-0737.

For the calculation of dynamic loads due to the fast opening of the pressurizer safety relief valves (PSRVs), pressurizer discharge system valves, and the presence of fluid in the loop seals, AREVA NP selected the S-TRAC computer program as discussed in U.S. EPR FSAR Tier 2, Section 3.9.1.2. S-TRAC results were satisfactorily compared to the measured data for safety relief valves. The structural effects were considered by processing the S-TRAC predicted force-time histories with a dynamic analysis structural model.

FSAR Impact:

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