From: Getachew Tesfaye
Sent: Sunday, May 18, 2008 12:03 PM
To: 'Pederson Ronda M (AREVA NP INC)'
Cc: Surinder Arora; Anne-Marie Grady; Christopher Jackson; Joseph Colaccino
Subject: Draft RAI No. 12
Attachments: Draft RAI 12 SPCV 245,257.doc

Ronda,
Attached please find the subject draft RAI. If you have any question or need clarifications regarding this RAI, please let me know as soon as possible, I will arrange a telecon with our technical staff.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP

E-mail Properties

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Request for Additional Information No. 12, Revision 0

5/18/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.06 - Containment Leakage Testing
SRP Section: 06.02.04 - Containment Isolation System
Application Section: 6.2
SPCV Branch

QUESTIONS

06.02.06-1
As-found and as-left testing requirements need to be clarified: Paragraph 9.2.5 of NEI 94-01, Revision 0, states:` The As-found Type A test leakage rate must be less than the acceptance criteria of 1.0 La given in the plant technical specifications. Prior to entering a mode where containment integrity is required, the As-left Type A leakage rate shall not exceed 0.75 La. The As-left and As-Found values are as determined by the appropriate testing methodology specifically described in ANSI/ANS 56.3-1994. Technical Specification (TS) 5.5.15.d.1 states: Containment leakage rate acceptance criterion is 1.0 La. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are <0.60 La for the Type B and C tests and ≤0.75 La for Type A tests. FSAR paragraph 6.2.6.1 also identifies ≤ 0.75 La as the acceptance criteria for the pre-service test and in-service Type A tests. In view of the above, please clarify the statement of TS 5.5.15.d.1 to clearly conform to the requirements of NEI 94-01. Specifically, TS 5.5.15.d.1 should make it clear that: a. That 1.0 La is the as-found value, and b. That ≤ 0.75 La is the as-left value that applies to both the preoperational (prior to unit initial startup) and the subsequent periodic Type A tests. If 1.0 La is not the as-found value or ≤ 0.75 La is not the as-left value, please provide an appropriate description and justification.

06.02.06-2
Incomplete inspection and test requirements need to be specified: 1. Does the DCD require visual containment inspections during two refueling outages where Type A testing intervals are extended to 10 years NEI 94-01 paragraph 9.2.1)? If so, where in the DCD is this requirement specified? 2. Which containment isolation valves are tested with pressure in a direction opposite to post-accident pressure (FSAR 6.2.6.3)? Also, where are justifications provided for this testing? 3. Is any Type B or Type C test conducted hydraulically rather than pneumatically? If so, what conservative bounding calculations are performed to convert the results to gaseous leakage and where is this documented? 4. What is the basis for exempting the fuel transfer tube from Type C testing?

06.02.04-1

Containment Isolation Valves (CIVs) require power for operability and to fulfill their safety functions in accordance with 10 CFR 50, Appendix A, General Design Criteria. It is not clear how operability is maintained if CIVs are powered by normally open breakers. DCA Tier 2, Table 6.2.4-1, Containment Isolation Valve and Actuator Data, shows numerous CIVs being powered from either MCC 31, 32, 33 or 34BRA, many of which are shown as normally open during operation. Per Tier 2, Figure 8.3-2, Emergency Power Supply System Single Line Drawing, Sheets 2 and 3, these MCCs are shown isolated from their respective 1E buses by normally open and manually operated breakers (see Note 1). Section 16, Technical Specifications, Section 3.6.3, requires each containment isolation valve to be Operable during normal operation. Per Page 1.1-4, Operable is defined as including all normal or emergency electrical power supplies. Considering the above, provide the following clarifications regarding the subject valves: 1) Are these CIVs provided with power during normal operation? If not, how does the Stage 1 isolation signal interface with power supplies which appear de-energized? 2) Clarify how Operability is maintained for the subject valves with respect to electrical power.

06.02.04-2

General Design Criterion 55, 56 and 57 require that isolation valves outside containment shall be located as close to the containment as practical. The DCA, while committing to this, does not provide any design criteria associated with this requirement. DCA Tier 1, Section 3.5, states that specifications exist for the components and piping configurations shown in Figure 3.5-1 and Table 3.5-1. DCA Tier 2, Section 6.2.4.2.1, General System Design, states that isolation valves outside containment are located as close as practical to the containment or shield building walls. Provide the specifications and criteria for the location of CIVs outside containment. Describe how the criteria supports that the GDC requirements are met. For example, for IRWST embedded piping with guard-pipe (no inside CIVs), what is the maximum allowable distance from the containment wall to the first outside CIV?

06.02.04-3

10 CFR 50.34(f)(2)(xiv)(A) states that containment isolation systems ensure all non-essential systems are isolated automatically by the containment isolation system. However, a number of valves listed in DCA Tier 2, Table 6.2.4-1 are listed as non-essential (a “no” listed in column 6), but are provided with no containment isolation signal. Examples include valves, KAB30 AA052/51, KAB30 AA053/55/56. In addition, a number of CEC and CSC air system penetrations which are listed as non-essential penetrate containment with normally open inside and outside manual valves (12 valves, sheet 11 of DCA Tier 2, Table 6.2.4-1). What is the bases for meeting 10 CFR 50.34(f)(2)(xiv)(A) for the above CIVs?

06.02.04-4

The DCA did not identify the methods, types, or number of containment isolation devices used for instrumentation and control lines. DCA Tier 2, Section 6.2.4.1, states that instrumentation and control lines that penetrate containment are designed to the requirements of RG 1.11. Please provide the following additional design information regarding EPR instrumentation relative to containment isolation. 1) Are instrument lines provided with automatic isolation (e.g., excess flow check valves), other devices capable of automatic isolation, or do they rely on remote-manual isolation and detection? 2) Will flow restrictors (e.g., orifices, etc.) be utilized to reduce the rate of coolant loss following instrument line breaks? What is the maximum distance allowed from the containment wall for devices such as orifices or excess flow check valves, if utilized? 3) Approximately, how many instrument lines penetrate containment for the EPR?

06.02.04-5

DCA Tier 2, Table 6.2.4-1, Containment Isolation Valve and Actuator Data, and Table 2.6.8-1 shows that CVS supply and exhaust valves KLA30 AA003, KLA30 AA002, KLA40 AA001, and KLA40 AA002, are containment isolation valves that receive a Stage 1 isolation signal. However, inconsistent with what is stated in Section 6.2.4.2.6, Isolation Valve Closure Times (12 inches in diameter close within one minute), no valve closure times are associated with these valves. For example, valves KLA40 AA001 and KLA40 AA002 associated with the full flow purge exhaust as shown on Figure 2.6.8-1. In the LOCA radiological analyses (Section 15.0.3.11.2), at the start of the accident, the containment is assumed to be in the purge mode. The purge flow is stated as being terminated within 10 seconds because of PC isolation. Provide the bases and justification for not having valve closure times for these CIVs.

06.02.04-6

Section 6.2.4.2.7, Penetrations Overpressure Protection, states that overpressure protection is provided for liquid-filled piping between containment isolation barriers to prevent damage when the piping is isolated…and that lines with gate, diaphragm, or butterfly valves have overpressure protection provided by either a bypass check valve or a pressure relief valve. Containment penetration overpressure protection configurations are shown in Figure 6.2.4-2-Containment Isolation Valve Arrangements for Overpressure Protection. Examples have been identified where there are configurations not shown on Figure 6.2.4-2 (typically two MOVs in series). Clarify how overpressure protection is provided for two valves in series. Examples include: 1) Figure 2.2.5-1, Sheet 2, which shows CIVs 30FAL12, AA001 and AA002 as two MOVs without a bypass check valve or pressure relief valve. 2) Figure 2.2.6-1, Sheet 1, which shows CIVs 30KBA14, AA002 and AA003 as two MOVs without a bypass check valve or pressure relief valve. 3) Figure 2.2.2-1, Sheet 1, which shows CIVs 30JNK10, AA013 and AA009 as two MOVs without a bypass check valve or pressure relief valve.

06.02.04-7

During the review a number of inconsistencies or discrepancies in Tables were identified. Please answer the following questions regarding information provided in the DCA. 1) DCA Tier 2, Section 6.2.4.2.2, discusses the exception of having both an inside and outside CIV for IRWST suction piping penetrations. A total of eight (8) CIVs located outside of containment are provided (4, one each for the SIS sumps; and 2 for each of the CVCS and SAHRS penetrations). Why is only one (JMQ40AA001) of these eight valves is located in DCA Tier 1, Table 3.5-1? 2) DCA Tier 1, Table 3.5-1, lists 93 CIVs, whereas Tier 2, Table 6.2.4-1 shows that there are 246 CIVs or devices credited for primary containment isolation. While Table 3.5-1 generally does not include items like hatches, airlocks, guard pipe, or a number of essential systems which do not receive automatic isolation signals, numerous other CIVs appear missing from the Tier 1 section. Examples include CIVs associated with the fuel pool cooling system, emergency boration system, CVCS seal injection, severe accident heat removal system, and CVS supply and exhaust. What is the bases behind why a small subset of CIVs is listed in Tier 1 Table 3.5-1? 3) Valves JEW50 AA001, JEW50 AA002, JEW01 AA005 are listed in DCA Tier 1, Table 3.5-2 but are not listed in Table 3.5-1. Why are these valves not included in Table 3.5-1? 4) Why is valve KTC10 AA010 not listed in DCA Tier 1, Table 3.5.2? Per Tier 2, Table 6.2.4-1 it is powered by an MOV, thus it appears as though it should be listed. 5) DCA Tier 1, Figure 3.5-1, Representative Containment Isolation Valve Arrangements, shows arrangements 2, 3, 4 and 7. However, Tier 1, Table 3.5-1, does not list any Configuration Type 2, 3, 4 or 7 arrangements for CIVs. Does the EPR utilize any of these general arrangements? If so, please provide which valves. If not, state why this information is provided in Tier 1, Figure 3.5-1. 6) DCA Tier 1, Figure 1.3-1 and 2.2.5-1 show valves 30FAL12 AA001 and AA002 (as well as several others) as globe valves. However, Tier 2, Table 6.2.4-1 lists these valves as gate valves. Do the figures provided accurately reflect whether or not a valve is a gate or globe valve? 7) Tier 2, Figure 2.3.3-1, SAHR System, shows a safety-related class break at a T-connection in the piping (base-mat cooling line to core melt stabilization system). This class break appears misplaced on the figure. Clarify where the break occurs. 8) Tier 2, Figure 2.3.3-1 shows valve 30JNK11 AA009 as what appears to be a motor operated relief valve. This valve type is not shown on the valve legend Tier 1, Figure 1.3-1 or what is shown on Figure 2.2.2-1 for the same valve. Which Figure is correct? 9) Tier 2, Table 6.2.4-1, Sheet 8 shows CIV JNK11 AA009 as being associated with an essential system (i.e., column 6 is marked “yes”). This is inconsistent with other portions of the table which considers SAHRS as a non-essential system. Which designation is correct?