Supplemental RAI Request for RAI 6.2-102 and 6.2-150

RAI 6.2-102 Supplement

DCD Tier 2, Revision 3, Sections 6.2.4.3.2.1 and 6.2.4.3.2.2, state that the passive containment cooling system (PCCS) has no containment isolation valves (CIVs). The heat exchanger modules and piping of the PCCS, outside containment, form closed systems. As the justification for having no CIVs, the DCD states that the PCCS does not penetrate containment, because the heat exchanger modules and piping are designed as extensions of the safety-related containment, and that the design pressure of the PCCS is greater than twice the containment design pressure and the design temperature is the same as the drywell design temperature.

In RAI 6.2-102, the staff stated that the PCCS must have CIVs, and, supported its position with extensive citations from the regulations (10 CFR Part 50, Appendix A, General Design Criterion 56) and the applicable official NRC guidance (Standard Review Plan 6.2.4, Rev. 2, "Containment Isolation System," and Regulatory Guide 1.141, "Containment Isolation Provisions for Fluid Systems," dated April 1978, which endorses national standard ANS-56.2/ANSI N271-1976, "Containment Isolation Provisions for Fluid Systems" (national standard)). Staff provided a quotation from the national standard that stated that even if the closed system outside containment is treated as an extension of containment, at least one CIV per line is still necessary.

GE's response, MFN 06-466, was a reiteration of their position that the system is considered an extension of the containment boundary, meaning that there are no containment penetrations in the PCCS, and therefore GDC 56, the SRP, the RG, and the national standard do not apply. The applicant cites several documents (other SRPs and GDC) which contain design provisions for the containment boundary, and states that the PCCS satisfies these provisions and so is an extension of containment.

Staff's Review of GE's Response:

(1) Staff's review found that the documents cited by the applicant only address design provisions for the containment in general such as for the walls and roof. The documents cited do not address any situation which is like the applicant's design (that is, a piping system outside of containment) or explain why no CIVs are needed in such a design. On the other hand, the guidance documents cited by the staff do specifically address designs like the PCCS.

(2) Staff understand that there is no explicit definition of "containment penetration" in the documents cited in staff's original RAI. Perhaps the authors felt that, when a pipe passes through the containment wall or roof (like the PCCS does), that this was obviously a containment piping penetration. However, there is the following definition in the national standard, in section 2, "Definitions and Terminology":

> Penetration assembly. An assembly that allows fluid lines or electrical circuits to pass through a single aperture (nozzle or other opening) in the containment.

Also, the national standard begins as follows:

> 1. Purpose and Scope
>
> The primary purposes of this Standard are to specify minimum design, testing and maintenance requirements for the isolation of fluid systems which penetrate the primary

containment of light water reactors. These fluid systems include piping systems (including instrumentation and control) for all fluids entering or leaving the containment.

When applying the definitions of the national standard, it can reasonable be interpreted that the PCCS design does indeed have containment penetrations thus requiring CIVs.

(3) Even within the DCD, there is contradiction as to whether the PCCS has containment penetrations. Revision 3 of the DCD contains a new table, 6.2-47, titled "**Containment Penetrations** Subject to Type A, B, and C Testing." This table lists 18 containment penetrations in the PCCS, numbered T15-MPEN-0001 through T15-MPEN-0018.

Staff agrees that the portion of the PCCS outside of containment is considered to be an extension of containment. However, the applicant concludes without sufficient justification that this inherently means there are no containment penetrations and thus no requirement for any CIVs. The applicant has not provided precedents, regulations, guidance documents, or any other reference to support this conclusion.

Alternatively, staff has cited a national standard endorsed by Regulatory Guide 1.141 which specifically address the case of a closed system outside of containment which is considered to be an extension of containment. This national standard states that there must be at least one CIV in each line.

Provide additional justification for the current design of the PCCS, or revise the DCD with a redesign of the system to include CIVs, per the NRC's applicable regulatory position.

Supplemental RAI 6.2-150

GE stated in response to RAI 6.2-150, MFN 07-009, that "No DCD changes will be made in response to this RAI." The information concerning the assumptions used to calculate the spray flow rate, including the timing of spray initiation should have been included in the DCD. Revise the DCD to include the appropriate information provided in RAI response 6.2-150.