RAI 3-2

Provide additional information that justifies the statement included in Section 7 of calculation package FS1-0024572, which states: "testing resulted in no failure of the cladding as verified by leak tests." Likewise, justify the conclusion in Sections 7 and 8 of calculation package FS1-0024572 that the GNF-J CTU 2J certification unit resulted in no failure of the simulated fuel assembly cladding after hypothetical accident condition tests.

The information presented in the SAR does not appear to be consistent with the statements in FS1-0024572. For example, SAR Section 2.12.1.3 stated that the CTU 1 and CTU 2 certification units were helium leak tested after the drop tests and that results from the CTU 2 tests indicated a helium leakage rate of 5.5E-6 atm-cc/s. In addition, there was no mention of helium leakage rate testing in SAR Section 2.12.2 for the corresponding GNF-J certification tests.

This information is required to ensure compliance with 10 CFR 71.51(a)(2) and 71.73.

AREVA Response

Section 1.2.2 "Containment System" states that the "primary containment boundary of this package is the fuel rod cladding". Section 4 "Containment" of the SAR identifies the package containment system and describes how the package complies with the containment requirements of 10 CFR 71.51, "Additional Requirements for Type B Packages."

The leak rate used in the evaluations in Section 4, particularly those within 4.4, was determined using the results of the testing of CTU-1 and CTU-2. As shown in Table 2-11 "Testing Summary" CTU-2 had a post drop leak test result of 5.5×10^{-6} atm-cc/s. This leak rate was evaluated in the SAR section 4.4, "Containment Under For Hypothetical Accident Conditions (Type B Packages)". This evaluation demonstrates that there is "no escape of other radioactive material exceeding a total amount A_2 in 1 week, and no external radiation dose rate exceeding 10 mSv/h (1 rem/h) at 1 m (40 in) from the external surface of the package" as required by 10 CFR 71.51.(a)(2). As the leak rate was demonstrated to meet the requirements of 10 CFR 71.51. (a)(2) the cladding is considered to not having "failed" in its function as a containment boundary.

In summary then although CTU-2 did show a leak rate of 5.5×10^{-6} atm-cc/s the cladding is not considered to having failed in that, although there was a leak from the cladding, the leak rate was well below regulatory requirements under HAC conditions.

In FS1-0024572 section 7, the statement that "testing resulted in no failure of the cladding as verified by leak tests" is correct in that the cladding, as demonstrated in the SAR section 4, did not fail in its function as a containment boundary.

Regarding section 8 which states "testing performed on a GNF-J CTU-2J resulted in no failure of the simulated fuel assembly cladding", this statement is consistent with the results reported in in section 2.12.2.3 "Test Performance", of the SAR.

AREVA does note that FS1-0024572 does not contain a definition of a "failed" rod, nor a specific reference back to section 4 of the SAR. This is considered appropriate in that the evaluations in document in FS1-0024572 are very narrow in scope. Specifically the evaluation is providing a technical basis for the updates to Table 3-5 "Maximum Pressure" of the SAR. Including a definition as to what constitutes a failed rod and the basis for that definition is outside the scope of the document.

Regarding the GNF-J certification tests, AREVA does not have any records from these tests which would indicate that a helium leak rate test was performed during that testing. The SAR, section 2.12.2 reads in part as follows: "For the U.S. testing, the GNF-J certification tests were utilized to determine the worst-case test orientations for the certification tests identified in Appendix 2.12.1." AREVA is not relying on the GNF-J tests for leak rate determination. All leak rate data is a result of the testing on CTU-1 and CTU-2 as described in the SAR, both in the current revision and previous revisions, including those for the RAJ-II SARs upon which the TN-B1 SAR is derived from.