

March 16, 2001

Mr. Steve Redeker  
Manager, Plant Closure and Decommissioning  
Sacramento Municipal Utility District  
6201 5<sup>th</sup> Street  
P.O. Box 15830  
Sacramento, CA 95852-1830

SUBJECT: ACCEPTANCE OF ASME CODE ALTERNATIVE REQUEST FOR THE  
RANCHO SECO INDEPENDENT SPENT FUEL STORAGE INSTALLATION  
(ISFSI), DOCKET 72-11 (TAC NO. L23275)

Dear Mr. Redeker:

By letter dated February 14, 2001, the Sacramento Municipal Utility District (SMUD) submitted a request to the Nuclear Regulatory Commission (NRC), in accordance with Technical Specification 4.3.4 of Materials License No. SNM-2510 for the Rancho Seco ISFSI, for approval of an alternative to the requirements of the American Society of Mechanical Engineers (ASME) B&PV Code, Section III, Subsection NB, paragraph NB-6112.1(a). The proposed alternative would allow a pneumatic test concurrent with the helium leak test, instead of a hydrostatic test for pressure testing of the NUHOMS Dry Shielded Canister (DSC) shell. The alternative would apply only to DSCs fabricated for use at the Rancho Seco ISFSI.

ASME B&PV Code, Section III, Subsection NB-6000, requires proof pressure testing of pressure vessels, and this requirement applies to the NUHOMS DSCs to be used at Rancho Seco. Section 4.3.4 of the NRC Safety Evaluation Report (SER) for the Rancho Seco ISFSI states that "The DSCs were designed, to the maximum extent practical, in accordance with ASME B&PV Code, Section III." The SER also states that "The confinement capability of the loaded DSC is assured by a combination of inspection techniques, including non-destructive, radiographic and dye penetrant testing, and internal pressure testing according to the ASME B&PV Code, Section III, ... and helium leak testing of the vessel cavity." In the SER, the NRC staff approved the Code exceptions listed in Appendix A of the Rancho Seco ISFSI Safety Analysis Report, Revision 4, dated November 24, 1999. However, a specific exception to the pressure test requirement for the DSC shell welds was not requested by SMUD nor approved by NRC.

Paragraph NB-6112.1(a) of the ASME B&PV Code, Section III, states that a pneumatic test may be used in lieu of a hydrostatic test only when any of the following conditions exist:

- 1) when components, appurtenances, or systems are so designed or supported that they cannot be safely filled with liquid, or
- 2) when components, appurtenances, or systems which are not readily dried are to be used in services where traces of the testing medium cannot be tolerated.

Although these conditions do not strictly apply to the fabrication of DSCs for use at Rancho Seco, the NRC staff previously considered a similar alternative to the ASME Code requirement for fabrication of NUHOMS DSCs, and found it acceptable. In a letter to VECTRA, the previous

vendor for the NUHOMS system, dated October 12, 1995, the NRC staff stated that, "...the leak rate tests... you described meet the requirements and objectives for proof pressure testing required by ASME B&PV Code, Division 1, Section III, Subsection NB-6000." The staff based this conclusion on a discussion provided in an internal, publicly available, NRC memorandum dated October 5, 1995, which stated:

Proof pressure testing is an element of verification for determining the capability of the DSC to meet the structural and leak-tightness conditions experienced under normal operating conditions. The test pressures described by VECTRA appropriately exceed the pressure the DSCs experience under normal operating conditions. Also, because 10 CFR 72.122(h) requires that "[t]he spent fuel cladding must be protected during storage..." an inert helium atmosphere is provided in the DSC. Therefore, consistent with the actual helium environment, the use of sensitive helium leak rate testing is a natural choice to verify the capability of the DSC to achieve the design allowable leak rate necessary to maintain the helium atmosphere. VECTRA has provided adequate justification as to how its helium leak rate tests also meet the test pressures, time at pressure, and other requirements of Subsection NB-6000. Thus, VECTRA has shown how the helium leak rate tests simultaneously meet the objectives of proof pressure testing.

With respect to SMUD's request for approval of the proposed alternative test of the DSC shell, you indicated that the calculated Service Level A design pressure is essentially the same as the test pressure required for the helium leak test. Therefore, the normal operating pressure on the DSC shell would be well below the proposed test pressure, and a pneumatic test will be capable of adequately demonstrating DSC structural integrity. You further noted that the resultant stresses in the DSC shell at the helium leak test pressure are well below allowable stresses, therefore, the alternative test would not pose a personnel safety hazard. Based on this information, and the staff's previous approval of the use of a pneumatic pressure test (helium) in lieu of a hydrostatic pressure test for the Standardized NUHOMS DSCs, the staff finds that your proposed alternative to the requirements of the ASME B&PV Code, Section III, Subsection NB, paragraph NB-6112.1(a), provides an acceptable level of quality and safety and accepts this alternative for the DSCs intended for use at the Rancho Seco ISFSI. Other than the change of the test medium, the remaining provisions of Subsection NB-6000 (including required test pressure) still apply, unless exceptions have been separately approved. If you have any questions, please contact James R. Hall of my staff at (301) 415-1336.

Sincerely,

/S/ /RA/

E. William Brach, Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Dockets 72-11 (50-312)

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vendor for the NUHOMS system, dated October 12, 1995, the NRC staff stated that, "...the leak rate tests... you described meet the requirements and objectives for proof pressure testing required by ASME B&PV Code, Division 1, Section III, Subsection NB-6000." The staff based this conclusion on a discussion provided in an internal, publicly available, NRC memorandum dated October 5, 1995, which stated:

Proof pressure testing is an element of verification for determining the capability of the DSC to meet the structural and leak-tightness conditions experienced under normal operating conditions. The test pressures described by VECTRA appropriately exceed the pressure the DSCs experience under normal operating conditions. Also, because 10 CFR 72.122(h) requires that "[t]he spent fuel cladding must be protected during storage..." an inert helium atmosphere is provided in the DSC. Therefore, consistent with the actual helium environment, the use of sensitive helium leak rate testing is a natural choice to verify the capability of the DSC to achieve the design allowable leak rate necessary to maintain the helium atmosphere. VECTRA has provided adequate justification as to how its helium leak rate tests also meet the test pressures, time at pressure, and other requirements of Subsection NB-6000. Thus, VECTRA has shown how the helium leak rate tests simultaneously meet the objectives of proof pressure testing.

With respect to SMUD's request for approval of the proposed alternative test of the DSC shell, you indicated that the calculated Service Level A design pressure is essentially the same as the test pressure required for the helium leak test. Therefore, the normal operating pressure on the DSC shell would be well below the proposed test pressure, and a pneumatic test will be capable of adequately demonstrating DSC structural integrity. You further noted that the resultant stresses in the DSC shell at the helium leak test pressure are well below allowable stresses, therefore, the alternative test would not pose a personnel safety hazard. Based on this information, and the staff's previous approval of the use of a pneumatic pressure test (helium) in lieu of a hydrostatic pressure test for the Standardized NUHOMS DSCs, the staff finds that your proposed alternative to the requirements of the ASME B&PV Code, Section III, Subsection NB, paragraph NB-6112.1(a), provides an acceptable level of quality and safety and accepts this alternative for the DSCs intended for use at the Rancho Seco ISFSI. Other than the change of the test medium, the remaining provisions of Subsection NB-6000 (including required test pressure) still apply, unless exceptions have been separately approved. If you have any questions, please contact James R. Hall of my staff at (301) 415-1336.

Sincerely,

/S/ /RA/  
E. William Brach, Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

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**C:\asmeexception.wpd** \*see previous concurrence

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Rancho Seco Nuclear Generating Station  
Docket Nos. 72-11 (50-312)

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