



Department of Energy
Washington, DC 20585

APR 29 1991

Mr. King Stablein
Repository Licensing & Quality
Assurance Project Directorate
Division of High-Level
Waste Management
Office of Nuclear Material
Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Stablein:

On December 14, 1990, the U.S. Department of Energy (DOE) transmitted responses to the U.S. Nuclear Regulatory Commission's (NRC) objections, comments, and questions contained in the NRC report entitled "NRC Staff Site Characterization Analysis of the Department of Energy's Site Characterization Plan, Yucca Mountain Site, Nevada", (NUREG-1347). In that transmittal, DOE inadvertently provided an identical response to Questions 34 and 35. Enclosed please find the correct response to Question 34; the response to Question 35 is correct as provided in the December 14, 1990 transmittal.

If you have any questions, please contact me at (202) 586-1462.

Sincerely,

Linda J. Desell
Acting Chief
Regulatory Integration Branch
Office of Systems and Compliance
Office of Civilian Radioactive
Waste Management

Enclosure: DOE corrected response to NRC Question 34.

cc with enclosure:
R. Loux, State of Nevada
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
S. Bradhurst, Nye County, NV
R. Guimond, EPA

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Section 8.3.4.2.G. Waste package fabrication and handling before emplacement
Design goal for closure. p. 8.3.4.2-30 para. 6.

QUESTION 34

It is stated that the level of undetected defective closures will be shown to be less than 1%.

What is meant by undetected defective closures? Does it mean undetected defects? What is the rationale for 1%? If the "defects" are "undetected" how can it possibly be shown conclusively that the number of "defective closures" is anything other than 0%? Furthermore, if the defects are "undetected," it is reasonable to assume that their characteristics/features and precise location cannot be determined with certainty, and that they cannot be repaired. Under such circumstances, what assurance is there that these defects will not get any larger or increase in number prior to emplacement or during the period requiring "substantially complete containment" of radionuclides?

BASIS

- o If the defects are "undetectable," how can it be demonstrated/proven that they are below a certain limit.
- o Existence of "undetectable" defects raises concerns about their nature and if and/or when they will increase in number or size, making the task of repair/rework difficult or impossible and raising further concerns about these "undetectable" defects leading to premature failures of closure joints.

RECOMMENDATIONS

- o Provide a more precise definition of a "defect," and explanation about "undetectable" defects. Give examples of "undetectable" defects.
- o The acceptable level of defects (detectable and undetectable) should have a rationale which relates to the performance objective for "substantially complete containment" by the waste package during the first 300 to 1,000 yrs after closure of the repository.
- o Techniques should be referenced and/or development plans provided for assuring that, in the aggregate, closures with an acceptable level of "undetectable" defects and defect-free closures will meet all pre-closure and post-closure requirements regarding containment and isolation of waste.

Undetected defective closures are those that have passed the standard helium leak tightness test, i.e., at less than 1×10^{-7} atm-cm³/sec, and the visual and nondestructive tests, but have undetected flaws that can lead to failure once emplaced into the repository. It is estimated that the fraction of containers with such undetected flaws is less than 0.1%, i.e., 99.9% of the containers do not contain such flaws. The value of 1% is provided as a conservative upper bound. Support for this assumption will be provided when the welding tests and nondestructive and destructive examinations are conducted on actual full scale containers.