



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
 WASHINGTON, D.C. 20555

JAN 29 1992

Ms. Kelli S. Johnston  
 3055 Sorrel  
 Las Vegas, Nevada 89102

Dear Ms. Johnston:

I appreciate your thoughtful letter of December 4, 1991.

This country's policies and general program for the permanent disposal of high-level waste (HLW) are defined by the Nuclear Waste Policy Act of 1982 (NWPA) and the Nuclear Waste Policy Amendments Act (NWPAA) of 1987. To provide the long-term permanent isolation required, the NWPA/NWPAA specify that HLW will be placed in deep-underground geologic repositories to be built and operated by the U. S. Department of Energy (DOE). To this end, DOE is developing a waste management system consisting, in part, of a geologic repository in which HLW can be permanently isolated deep beneath the surface of the earth, and a monitored retrievable storage (MRS) facility in which waste can be stored prior to permanent disposal. This waste management system is not unlike those of Canada and Sweden that you referenced in your letter. Further, the NWPA/NWPAA defines the responsibilities of the DOE and the U.S. Environmental Protection Agency (EPA), and the U.S. Nuclear Regulatory Commission (NRC). The DOE has the responsibility for storing and disposing of HLW. This includes characterizing a site for a repository and demonstrating whether it is suitable for disposal of HLW. The EPA is responsible for developing appropriate environmental standards for HLW storage and disposal. The NRC has the authority to license and regulate both the storage and the disposal of HLW, including implementation of the EPA standards.

Through the NWPAA, Congress designated the Yucca Mountain site in Nevada as the single candidate site for characterization as a potential geologic repository. The Yucca Mountain site has not been selected for a repository; rather, it has been chosen as the only site to be characterized at this time. Site characterization is a program of exploration and research, both in the laboratory and in the field, undertaken to establish the geologic conditions at a particular site to determine if the site is suitable for disposal of HLW. In parallel with site characterization is a testing program leading towards selection of the material and the design to be used in the development of waste packages.

With respect to your specific concerns about the ability of a waste package to last 10,000 years, recognizing the uncertainties associated with predicting the performance of a repository for thousands of years, the NRC requires a multibarrier approach for isolation of high-level waste. These barriers include the waste package, an underground engineered barrier system and the natural geologic setting. The NRC's regulations have performance requirements for each barrier. While the use of multibarriers allows one barrier to help compensate for some uncertainty in the performance

9202110005 920129  
 NMSS SUBJ  
 411.3 PDR

411.3  
 WM-1  
 NRC 1/0

of other barriers, each barrier must be shown to independently perform and provide for isolation of waste. Under the NRC regulations, the waste package is required to provide substantially complete containment for 300-1000 years during the period of high thermal heat and the decay of short lived radionuclides. The engineered barrier and natural systems are then required to provide waste isolation for thousands of years. Even if DOE chooses to develop a waste package that lasts 10,000 years, they will still be required to demonstrate that the engineered barrier and natural systems each make a significant contribution to the overall performance of the repository.

The NRC will only license a repository at Yucca Mountain if DOE has demonstrated through extensive site characterization, waste package testing, and design, that a repository at Yucca Mountain meets both the NRC's requirements and those of the EPA. If a site is licensed and operated at Yucca, DOE will have to demonstrate through an ongoing performance confirmation program that the site, waste package and engineered barrier system perform as predicted. NRC regulations also require that any repository be designed to preserve the option of retrieval during the period that wastes are being emplaced and thereafter until the completion of a performance confirmation program.

Thank you for your interest and I hope that this letter is responsive to your concerns. In addition, enclosed is some general information (NRC's regulations for the "Disposal of High-Level Radioactive Wastes in Geologic Repositories" and DOE's "Project Decision Schedule") regarding high-level waste disposal which may be of interest to you.

Sincerely,

15/

B. J. Youngblood, Director  
Division of High-Level Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosures:  
As stated

	<u>DISTRIBUTION</u> (HLWM-0012)		
CNWRA	NMSS R/F	HLPD R/F	LSS
LPDR	ACNW	PDR	Central File
BYoungblood, HLWM	JLinehan, HLWM		RBaillard, HLGE
JHolonich, HLPD	DBrooks, HLPD	AGarcia, HLPD	MFederline, HLHP

OFC :HLPD	:HLPD	:HLWM	:HLWM	
NAME:Garcia	:JHolonich	:JLinehan	:JYoungblood	
Date: 1/25/92	: 1/29/92	: 1/29/92	: 1/29/92	: