

SEP 20 1984

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Mr. James G. McCray
Publicity and Publications Chairman
Department of Nuclear and Energy Engineering
University of Arizona
Tucson, Arizona 85721

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Dear Mr. McCray:

Pursuant to your letter of August 15, 1984 inviting a paper on the topic of NRC licensing requirements for high level radioactive waste packages, I have the pleasure of accepting your invitation and have enclosed an abstract. This paper will be prepared by several members of the Material Engineering Section of our Waste Management Engineering Branch who are responsible for the technical review of waste package related information. The paper will be presented by Dr. Michael Tokar, who spoke with you by telephone on September 10, 1984 concerning details of the abstract. It is our understanding that the abstract, which will not be published (although the full paper will), should be 1-2 pages in length and should convey the substance of our proposed presentation. We trust that we have met the acceptance criteria.

If there are any questions, please contact Dr. Tokar at (301) 427-4748. Thank you for inviting us to present this paper.

Sincerely,

Original Signed by
MICHAEL J. BELL
Michael J. Bell, Deputy Director
Division of Waste Management

cc: M. Frei, DOE/HQ

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NRC Licensing Requirements for High Level Radioactive Waste Packages

by

M. Tokar, K. C. Chang, T. C. Johnson, T. L. Jungling, C. H. Peterson,
and E. A. Wick

This paper addresses current and proposed NRC requirements for high level waste (HLW) packages as those requirements are presented in various documents released to the general public or under development. The documents in question include (a) those sections of Part 60 of Title 10 of the Code of Federal Regulations (10 CFR 60) that are most directly related to high level waste package concerns, (b) formal technical positions that have the purpose of providing specificity regarding HLW package licensing requirements that are addressed in only general terms in 10 CFR 60, and (c) recent NRC memoranda and correspondence that attempt to clarify certain portions of 10 CFR 60 that may be ambiguous or worded in a confusing manner and that are thus susceptible to misinterpretation.

Subparts of 10 CFR 60 that are addressed here include the following: (1) Subpart 60.2, concerning definitions of waste package, waste form, and engineered barriers; (2) Subpart 60.11, concerning preapplication review of site characterization report descriptions of waste package/waste form R&D and QA programs; (3) Subpart 60.21, concerning license application safety analysis report requirements for descriptions and assessments of engineered barrier/waste package-related factors important to safety; (4) Subpart 60.31, concerning construction authorization waste package-related considerations; (5) Subpart 60.43, concerning license issuance and amendments including license conditions on waste packages; (6) Subpart 60.111, concerning preclosure occupational exposure (10 CFR 20) and waste retrievability; (7) Subpart 60.113, concerning waste package performance objectives; (8) Subpart 60.135, concerning waste package design criteria; and Subpart 60.143, concerning monitoring and testing of waste packages. Clarification is provided for the "substantially complete containment" requirement for HLW, and a sample calculation is given in illustration of how to apply the "one part in 100,000" radionuclide release rate criterion.

NRC Waste Management Engineering Branch Technical Positions address the following waste package areas of concern: (1) waste package technical issues for basalt, tuff and salt repositories and (2) waste package reliability. At this writing these documents are in draft form and either have been recently released for comment or are about to be released. The waste package issue technical positions called "Umbrella Site Technical Positions (USTPs)," are intended to establish NRC's understanding and guidance regarding technical questions (specific issues) relevant to waste package design and performance at three different types of geologic repositories. The USTP's are also intended to provide (a) an independent benchmark for assessing DOE's identification of issues and (b) a standardized, systematic and consistent tracking system.

The Draft Technical Position (DTP) on Waste Package Reliability describes an assessment method that would be acceptable to NRC staff for demonstrating reasonable assurance that the waste package will meet 10 CFR 60 performance objectives. The method consists of using the reliability assessment principles described in the DTP in combination with a fault tree analysis.