

INTRODUCTION

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ASTM International Subcommittee C26.13 on Spent Fuel and High Level Waste

The ASTM International Subcommittee C26.13 on Spent Fuel and High Level Waste sponsored and held a seminar on accelerated testing of materials in spent nuclear fuel (SNF) and high-level waste (HLW) storage systems during an ASTM International Committee Week, on January 27 and 28, 2005, in Atlanta, Georgia. Materials relevant to interim storage, transport, and geologic disposal of HLW and SNF were discussed. Speakers and contributors from the United States, Canada, France, the United Kingdom, Belgium, and Germany presented relevant studies for storage and disposal concepts providing a well-rounded and stimulating two-day exchange.

The central scope and purpose of the seminar included the role and understanding of accelerated testing and the identification of important related alteration mechanisms to qualify materials used for HLW glass and SNF interim dry-storage systems and repositories. The seminar focused on the ability of cask materials and components of the engineered barrier system, waste forms, waste packages, and backfill used in repository disposal to contain and control radionuclide release and maintain criticality control and shielding capability.

By qualification, we mean the establishment of a scientific and engineering basis and understanding of material performance to support regulatory requirements and the licensing process. For example, by combining the understanding of alteration mechanisms with appropriate accelerated testing programs, a credible monitoring and failure prediction capability is possible. The real goal is to be able to detect incipient failures long before serious degradations unfold in time blocks that provide confidence to society. With this seminar, and its succes-

sors planned on this subject, we hope to contribute to this endeavor along with similar efforts in the world.

It is worth noting that this seminar, and those to follow, addresses the issues raised in the roadmap^a subjects, engineered barrier performance and source term radionuclide release, in terms of physical mechanisms and quantitative performance.

The papers related to the ASTM International Subcommittee seminar that appear in this issue are M. Hélie et al., "Prediction of Corrosion Behavior of HLW Containers in the Framework of the French Interim Storage Concept"; R. E. Mizia et al., "Development and Testing of An Advanced Neutron-Absorbing Gadolinium Alloy for Spent Nuclear Fuel Storage"; and E. M. Pierce et al., "The Accelerated Weathering of a Radioactive Low-Activity Waste Glass Under Hydraulically Unsaturated Conditions: Experimental Results from a Pressurized Unsaturated Flow Test."

Additional papers presented or contributed at this and future seminars will be submitted for publication in *Nuclear Technology*.

The ASTM International Subcommittee C26.13 appreciates the publication of these papers in the spirit of improving the understanding of performance assessment so that persuasive performance prediction and monitoring can be implemented for SNF and HLW storage and repository systems.

^aS. MOHANTY, "Introduction," *Nucl. Technol.*, **148**, 104, (2004). This issue was devoted to research on performance assessment related to safety.