

WORKSHOP ON ULTIMATE DISPOSAL

William P. Bishop, Sandia Laboratories, Chairman

This workshop discussed radioactive waste disposal technology and public acceptance issues. The starting point for discussion was a list of issues raised during the morning session:

- partitioning
- re-inventing the wheel
- recognition of an adequate disposal method
- programmatic approach, especially timelines
- implications with regard to moratoria, other fuel cycle operations.

The first item discussed was partitioning. John Bartlett outlined the chemical separations technology involved. The objective of the process would be to remove long-lived residual actinides from high-level waste prior to disposal in order to reduce or eliminate the potential long-term radiation hazard. John indicated that some of the fission product isotopes might be as much or more of a long-term potential hazard as the actinides.

The discussions of long-term and short-term safety associated with partitioning led to consideration of recognition of adequate disposal methods and yardsticks for safety. Gene Rochlin asked what's the benefit of cost-benefit analysis and stated that safety evaluations must find a way past the cost-effectiveness concept. There was consensus that credibility and public confidence are key factors in adequacy of a disposal method. Members of Congress get messages that the public wants the waste out of sight, out of reach, out of mind, and "out of my state."

Walt Belter outlined disposal methods previously investigated (bedded salt, deep injection, deep bedrock, and shale) and Bill McClain described the current geologic disposal evaluation program at Oak Ridge. This program will develop a three-dimensional matrix of waste type, rock type, and emplacement options. They expect the matrix to contain about 4,000 total elements, of which about 90% will be technically absurd. The remainder will be evaluated and winnowed to select promising concepts.

Discussion of the Oak Ridge program led to consideration of whether or not it constituted re-inventing the wheel. Harvey Soule said it represents investigation of backups for previously studied concepts. The ERDA is trying to avoid "putting all their cans in one basket."

William Rowe expanded his morning presentation by stating that he identifies three types of disposal method acceptance: technical, public, and management. He further stated that in his morning presentation he was calling for demonstration of technical acceptance in the near-term. John Bartlett noted that this puts the proposed EPA, Canadian, European Economic Community, and Battelle programs on the same basic schedule.

Art Lewis of Lawrence Livermore Laboratory described a disposal concept involving boiling liquid in a rock cavity. Bill Luth of Stanford discussed an in-situ melting concept, and Dick Lincoln described Sandia Laboratories' rock melting concept.

Charles Hollister of Woods Hole Oceanographic Institute discussed seabed disposal. He stated that the mid-plate, mid-gyre regions of the oceans are the most boring, stable places on earth. They are resource limited, contain tens of millions of square kilometers of sediment suitable for disposal, and are biologically unproductive. Basic capability for seabed disposal is demonstrated by the fact that more than 400 holes have been drilled in bedrock beneath the oceans and sediments.

The workshop closed with a recapitulation of criteria for judging disposal concepts. These included:

- Cost-effectiveness is not necessarily the leading criterion.
- Acceptable use of the political process is necessary.
- Acceptability is a function of time and irreversible.
- Technical irreversibility, i.e., an incapacity to change your mind, should be considered.
- Disposal sites should provide permanent isolation of wastes from man and good containment. They should be free from sudden events.
- Implementation timing should be acceptable.
- Commercial and government wastes should be treated as a whole.
- Demographic and sociological factors should be considered.

A consensus on how to structure, quantify, and apply such criteria was not obtained.