

BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



High-Level Radioactive Waste Management

Editor Milton H. Campbell
Publishers American Chemical Society (1976)
Pages 166
Price \$18.50
Reviewer E. Linn Draper, Jr.

This book is the written record of a symposium sponsored by the American Chemical Society in April 1974. It consists of 12 separately authored chapters describing federal waste management plans; activities at U.S. government, commercial, and foreign facilities; and technical status reports on several waste management research and development projects.

The time elapsed between the symposium and the publication of the book (1976) detracts from the usefulness of the material in several of the chapters. Technical activities in waste management are affected by the change in government policy, and the changes have been frequent in the past three years.

In particular, Chap. 1 describes the U.S. Atomic Energy Commission (AEC) plan for retrievable surface storage of waste as envisioned in 1974. Since that time, the government plan has readopted (and abandoned?) the geologic disposal of solidified waste as the preferable alternative and more recently stated that reprocessing would be deferred indefinitely. Chapter 1 is only of historical interest.

Chapters 2, 3, and 4 deal with management of government wastes through spring of 1974 at Savannah

River Laboratory, the National Reactor Testing Station (NRTS) (now INEL), and Hanford Engineering Development Laboratory, respectively. These chapters present past activities and future plans and give a clear account of the technical differences in waste forms at the three facilities and the consequent differences in methods of operation. In the three or so years that have passed since these chapters were prepared, the activities have progressed but have not changed so much as to make the descriptions obsolete.

Chapter 5 describes the activities at the Nuclear Fuel Services West Valley plant as if the return to operation were imminent. It now appears that the plant will not reopen, so the principal value of this chapter is the description of the waste form and the historical record of past operating techniques.

Chapters 6 through 11 describe research efforts at various laboratories on several specific topics. Chapter 6 discusses the Oak Ridge research and development program, with particular attention paid to actinide partitioning and recycle and the geologic exploration programs. This chapter is an interesting account of efforts but suffers from being three years old.

Chapter 7 discusses the Battelle Pacific Northwest Laboratories experiments with a variety of glassy solidified waste. Physical properties, especially leach rates, of candidate waste forms are discussed in a clear and straightforward presentation.

Chapter 8 describes efforts by the Atlantic Richfield Hanford Company to incorporate waste in solid forms other than glass and gives data on a number of the properties of these materials.

Chapter 9 is an especially inter-

esting description of Argonne National Laboratory (ANL) experiments to ascertain the migration rate of plutonium through rock. This work would seem germane regardless of the waste form finally selected.

Chapter 10 is a description of attempts to remove cesium and strontium from the spent fuel storage pool water at NRTS. Ion exchange and precipitation techniques are discussed in sufficient detail to allow assessment of alternatives.

Chapter 11 is an account of techniques used at ANL to assay very low levels of transuranium concentration in environmental water. The objective of the studies was to establish baselines and the ability to detect contamination at the sub-fCi/1 level.

The final chapter is a description of waste management practices and plans in Germany, England, and France. This chapter, like the first, suffers from being out of date.

The book is well done, the chapters are interesting, and some of the content is as relevant today as when it was written. Other segments are no longer accurate in view of our current posture on reprocessing, and the reader unfamiliar with activities in the waste management field in the past three years will be misled.

E. Linn Draper, Jr. is the director of The Nuclear Engineering Program at the University of Texas at Austin, where he has served on the faculty for the past eight years. He has been active in the public discussion of the efficacy of nuclear power and has recently completed a term on the Board of Directors of the American Nuclear Society. Dr. Draper is a member of the National Academy of Sciences Committee on Radioactive Waste Management.