

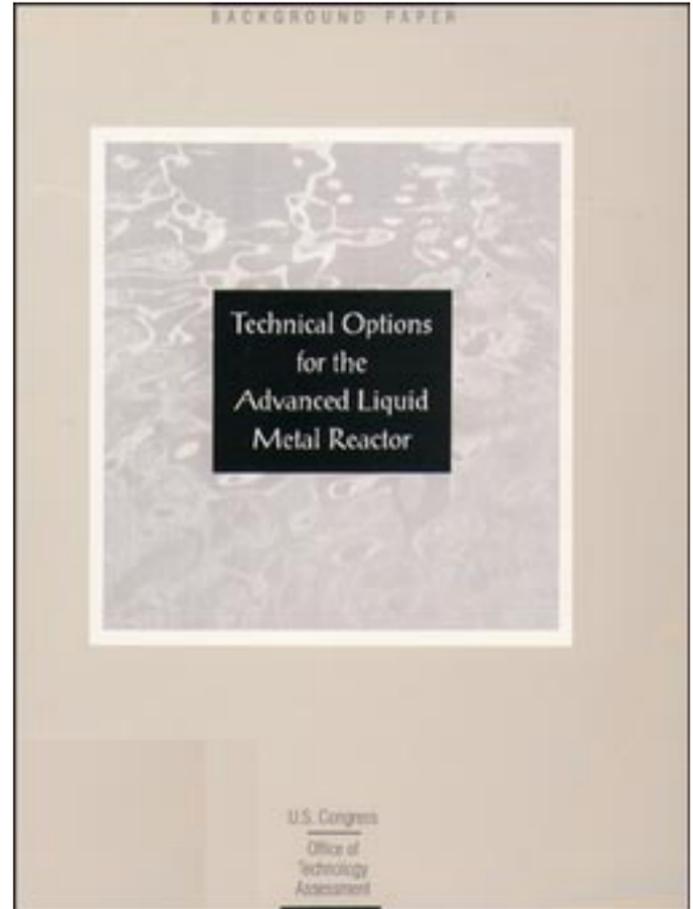
*Technical Options for the Advanced Liquid
Metal Reactor*

May 1994

OTA-BP-ENV-126

NTIS order #PB94-173994

GPO stock #052-003-01370-3



Recommended Citation: U.S. Congress, Office of Technology Assessment, *Technical Options for the Advanced Liquid Metal Reactor---Background Paper*, OTA-BP-ENV-126 (Washington, DC: U.S. Government Printing Office, May 1994).

Foreword

In this post-Cold War era, scientists and engineers have focused much research on the development of technologies to address the legacy of the nuclear arms race. One of the more intractable problems currently is how to dispose of excess plutonium from retired nuclear weapons and how to manage radioactive plutonium waste. The Office of Technology Assessment covered this issue in its 1993 assessment *Dismantling the Bomb and Managing the Nuclear Materials*. The House Committee on Energy and Commerce, Subcommittee on Energy and Power, asked OTA to expand the technical analysis of the advanced liquid metal reactor (ALMR).

This background paper discusses the history and status of the ALMR research program. It presents applications of this technology to the plutonium disposition problem and the possible advantages and disadvantages of its future development and deployment. It also discusses related issues such as waste management and concerns about proliferation of plutonium material.

With regard to its application to the plutonium disposition problem, ALMR technology will require a decade or more of research and testing before the performance of a complete system could be ensured. Even though complete elimination of the plutonium isotope within the reactor is theoretically achievable with this technology, other aspects of full-scale deployment must be considered in setting goals and objectives for a development program.

OTA appreciates the assistance and support it received for this effort from many contributors and reviewers, including the Argonne National Laboratory, the General Electric Company, the Department of Energy, other independent research organizations and public interest groups, and many individuals. They provided OTA with valuable information critical to the completion of this paper and important insights about its technical evaluations and projections. OTA, however, remains solely responsible for the contents of this report.

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ROGER C. HERDMAN
Director

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Lawrence Livermore National Laboratory

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Note: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the reviewers. The reviewers do not, however, necessarily approve, disapprove, or endorse this background paper. OTA assumes full responsibility for the background paper and the accuracy of its contents.

Project Staff

Clyde Behney
Assistant Director
*Health, Education, and the
Environment*

Robert Niblock
Environment Program Director

PETER A. JOHNSON
Project Director

Mark Brown
Principal Analyst

CONTRIBUTORS

Paul Carroll
Kathryn Cox
Lois Joellenbeck

ADMINISTRATIVE STAFF

Kathleen Beil
Office Administrator

Nellie Hammond
Administrative Secretary

Kimberly Holmlund
Administrative Secretary

Sharon Knarvik
Secretary

Jene Lewis
Administrative Secretary