

# Contents

## 1 Introduction and Summary 1

- Focus of OTA's Analysis 2
- Summary of ALMR Evaluation 3
  - = **Disposing of Weapons Plutonium** 3
    - Processing Spent Reactor Fuel 4
    - Processing Other Radioactive Wastes 4
  - = Risks and Benefits in Terms of Plutonium Proliferation 4
- Conclusion 5

## 2 History of Liquid Metal Reactors in the United States 7

- The Present ALMR/IFR Concept 8
  - Goals of the ALMR/IFR Program 9
  - = Previous Analyses of the ALMR/IFR Concept 11

## 3 Description of the ALMR/IFR Program 13

- Future Full-Scale Commercial Development 15
  - The ALMR/IFR Fuel Reprocessing System 17
  - LWR Spent Fuel Reprocessing System 24

## 4 Evaluation of the ALMR/IFR Technology 27

- Disposing of Weapons Plutonium 28
- Nuclear Waste Management 30
  - Processing Spent Reactor Fuel 30
  - Processing Other Radioactive Wastes 32
- Proliferation Risks and Benefits 32
  - = Concerns About Plutonium Breeding 32
  - Concerns About Weapons-Usable Plutonium 33
- Role of Nuclear Safeguards 36
- Political Barriers 37
- Beyond the Spent Fuel Standard for Proliferation Resistance 39

## APPENDIX

### A Abbreviations and Glossary 41

### References 45

