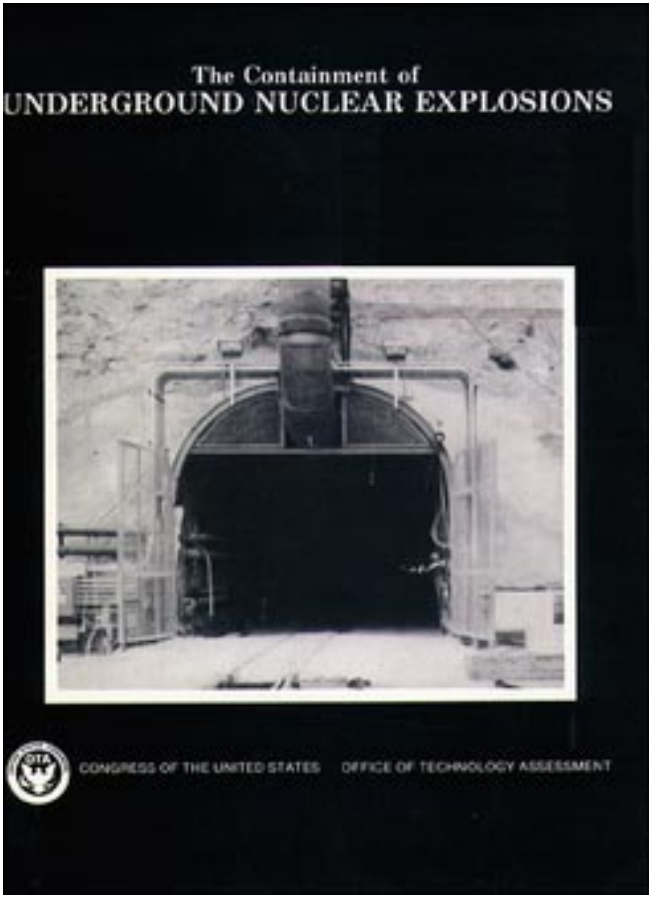
The Containment of Underground Nuclear Explosions

October 1989

NTIS order #PB90-156183



Recommended Citation:

U.S. Congress, Office of Technology Assessment, *The Containment of Underground Nuclear Explosions, OTA-ISC-414* (Washington, DC: U.S. Government Printing Office, October 1989),

Library of Congress Catalog Card Number 89-600707

For sale by the Superintendent of Documents
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Foreword

Within weeks after the ending of World War II, plans for the first nuclear test series "Operation Crossroads" were underway. The purpose then, as now, was to develop new weapon systems and to study the effects of nuclear explosions on military equipment. The development of the nuclear testing program has been paralleled by public opposition from both an arms control and an environmental perspective. Much of the criticism is due to the symbolic nature of testing nuclear weapons and from the radiation hazards associated with the early practice of testing in the atmosphere. Recently, however, specific concerns have also been raised about the current underground testing program; namely:

. Are testing practices safe?
. Could an accidental release of radioactive material escape undetected?
- Is the public being fully informed of all the dangers emanating from the nuclear testing program?

These concerns are fueled in part by the secrecy that surrounds the testing program and by publicized problems at nuclear weapons production facilities.

At the request of the House Committee on Interior and Insular Affairs and Senator Orrin G. Hatch, OTA undertook an assessment of the containment and monitoring practices of the nuclear testing program. This special report reviews the safety of the nuclear testing program and assesses the technical procedures used to test nuclear weapons and ensure that radioactive material produced by test explosions remains contained underground. An overall evaluation considers the acceptability of the remaining risk and discusses reasons for the lack of public confidence.

In the course of this assessment, OTA drew on the experience of many organizations and individuals. We appreciate the assistance of the U.S. Government agencies and private companies who contributed valuable information, the workshop participants who provided guidance and review, and the many additional reviewers who helped ensure the accuracy and objectivity of this report.

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Acknowledgments

OTA gratefully acknowledges the valuable contributions made by the following:

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