

Introduction

From the first explosion of what eventually numbered just over two thousand nuclear weapon tests around the world, there arose mixed feelings ranging from awe to fear about what man's scientific prowess had accomplished. While proponents of nuclear power optimistically anticipated a variety of peaceful uses, more cautious observers focused on the destructive power that was now available and the potential for an unconstrained arms race that could lead ultimately to a nuclear Armageddon. It took almost a decade of testing ever more powerful devices in a variety of locations and environments by a growing number of countries before fears also focused on the environmental and health hazards associated with such testing.

Since 1945, nuclear tests have been conducted worldwide (see exhibit "Summary of Nuclear Weapons Tests" for a breakout of the total number of tests). Most of these tests were underground explosions, due in large measure to the negotiation of the Limited Test Ban Treaty (LTBT) in the early 1960s (see Chapter 1, "Early Efforts to Limit Nuclear Testing", p. 6 below,

SUMMARY OF NUCLEAR WEAPONS TESTS

United States	1,030	United Kingdom	44
USSR/Russia	715	India	6
France	210	Pakistan	?
China	45	Israel/S. Africa	?
Total nuclear weapons tests			2,050*

*Excludes the undetermined number of tests conducted by Pakistan, Israel, and South Africa.

for details on the LTBT). However, during the peak years of testing (immediately before and after the 1959–1960 U.S.–USSR testing moratorium), the United States and the Soviet Union conducted a large number of atmospheric tests. Each of the five original nuclear weapon states began its testing program with atmospheric explosions before shifting exclusively to underground tests (Koplow 1990). With the likely exception of Israel and South Africa, the other countries that have tested have done so underground.

The *United States* was first to test in July 1945, before exploding two nuclear weapons over Japan to end World War II in the Pacific. Through the 1950s, U.S. tests were largely atmospheric with a few underwater. The United States tested the largest number of devices in any given year—96 (39 above ground and 57 underground) in 1962, one year after the end of the moratorium. After signature of the Limited Test Ban Treaty in 1963, all U.S. testing took place underground. The United States tested the most of any country; total U.S. tests reached 1,030 before the United States initiated a unilateral moratorium on testing in 1992.

The *Soviet Union* tested its first nuclear device in 1949. Like the United States, most of its early tests were aboveground, but it restricted all testing to underground following signature of the Limited Test Ban Treaty in 1963. Its highest number of tests was 51 in 1961 following the end of the 1959–1960 test moratorium. However, the Soviet Union exploded the largest device of any country—50 megatons on October 30, 1962 (Seaborg 1983). By the early 1990s, when it agreed to initiate a unilateral moratorium on testing, the Soviet Union had exploded 715 devices.

The *United Kingdom* was the third country to test; its first nuclear explosion was in 1952. Its maximum number of tests per year reached seven in 1957. It, too, observed the Limited Test Ban Treaty and restricted all testing to underground after the early 1960s. Because the United Kingdom used the U.S. Nevada Test Site exclusively for its later tests, it was forced to observe the test moratorium declared by the United States in 1992. UK nuclear tests totaled 44.

France joined the small but growing group of nuclear weapon states with its first test in 1960. After initially testing in Algeria, France conducted all remaining tests at its site in the Mururoa Atoll in the Pacific Ocean. France conducted atmospheric tests until the mid-1970s, when it finally signed the Limited Test Ban Treaty, and all subsequent tests were underground. During the CTBT negotiations, France announced that it was necessary to conduct a few more tests in order to be able to sign the indefinite, comprehensive ban. By early 1996, when it announced a unilateral moratorium, French tests totaled 210.

China was the last of the original five declared nuclear weapon states and first tested in 1964. All of China's tests have been conducted at its test site at Lop Nur in Western China. Like France, China did not restrict its testing to underground until the mid-1970s. And like France, China announced during the CTBT negotiations that it also had to conduct some additional tests before signing the Treaty. China's tests, which ended with a unilateral moratorium in July 1996, totaled 45.

India first tested a nuclear device in 1974, declaring it to be a peaceful nuclear explosion. India did not conduct any further tests until May 1998, when it announced that it had tested five nuclear devices in the Pokharan Range. In response, *Pakistan* later that month conducted several nuclear explosions of its own in the Chagai Hills of Western Pakistan. Islamabad has never divulged the total number of its nuclear explosions. India and Pakistan have been honoring parallel unilateral moratoria in testing since early 1999.

Israel and *South Africa*, as discussed on pp. 55–56, are believed by many to have conducted at least one joint nuclear explosion in 1979. If true, these are the only other countries known to have conducted nuclear explosions (Circincione 2002).

The growing number of countries conducting tests and the increased size of the early detonations led to international concerns and various efforts to

limit, and if possible, ban all nuclear testing. This effort has had some significant measure of success, but a permanent total ban on testing still eludes the international community. Ten years ago many believed that negotiation of the Comprehensive Nuclear Test Ban Treaty (CTBT) had achieved that objective and would finally serve as the capstone for international efforts to ban nuclear testing forever. This book describes the ups and downs of that effort to negotiate and implement the CTBT.