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The Treaty on the Limitation of Underground Nuclear Weapon Tests, also known as the Threshold Test Ban Treaty (TTBT), was signed in July 1974. It establishes a nuclear "threshold," by prohibiting tests having a yield exceeding 150 kilotons (equivalent to 150,000 tons of TNT).

The threshold is militarily important since it removes the possibility of testing new or existing nuclear weapons going beyond the fractional-megaton range. In the 1960s, many tests above 150 kilotons were conducted by both countries. The mutual restraint imposed by the Treaty reduced the explosive force of new nuclear warheads and bombs which could otherwise be tested for weapons systems. Of particular significance was the relationship between explosive power of reliable, tested warheads and first-strike capability.

The task of negotiating a comprehensive test ban remained on the agenda of the U.S. Government, and, in Article I, the parties to the Threshold Test Ban Treaty undertook an obligation to continue negotiations toward that goal.

The first proposal for stopping nuclear weapon tests was made in 1955, and the first major negotiations with the Soviet Union for an effectively controlled test ban began in Geneva in 1958, with the United Kingdom also participating. The Conference on the Discontinuance of Nuclear Weapon Tests produced no agreement. The problem of working out verification procedures to ensure compliance with a complete ban on nuclear weapon tests in all environments proved to be intractable at that time. The procedures deemed necessary by the United States and the United Kingdom were not acceptable to the Soviet Union.

In 1963 the Limited Test Ban Treaty (LTBT) was signed by the Soviet Union, the United States, and the United Kingdom. This Treaty prohibits nuclear weapon testing in the atmosphere, in outer space and under water. The parties also agreed not to carry out any nuclear weapon test, or any other nuclear explosion, in any other environment -- i.e., underground -- that would cause radioactive debris to be present beyond the borders of the country in which the explosion took place.

Underground nuclear explosions were not prohibited by the 1963 Treaty, although both in the Treaty preamble and Article I, the LTBT parties pledged to seek "the discontinuance of all test explosions of nuclear weapons for all time...."

The United States and Soviet Union agreed in the spring of 1974 to pursue the possibilities of further restrictions on nuclear testing. Accordingly, a team of U.S. experts was sent to Moscow for technical talks.

Agreement on the Threshold Test Ban Treaty was reached during the summit meeting in Moscow in July 1974. The Treaty included a protocol which detailed technical data to be exchanged and which limited weapon testing to specific designated test sites to assist

verification. The data to be exchanged included information on the geographical boundaries and geology of the testing areas. Geological data -- including such factors as density of rock formation, water saturation, and depth of the water table -- are useful in verifying test yields because the seismic signal produced by a given underground nuclear explosion varies with these factors at the test location. After an actual test has taken place, the geographic coordinates of the test location are to be furnished to the other party, to help in placing the test in the proper geological setting and thus in assessing the yield.

The Treaty also stipulates that data will be exchanged on a certain number of tests for calibration purposes. By establishing the correlation between stated yields of explosions at the specified sites and the seismic signals produced, this exchange improved assessments by both parties of the yields of explosions based primarily on the measurements derived from their seismic instruments. The tests used for calibration purposes may be tests conducted in the past or new tests.

Agreement to exchange the detailed data described above represented a significant degree of direct cooperation by the two major nuclear powers in the effort to control nuclear weapons. For the first time, each party agreed to make available to the other data relating to its nuclear weapons test program.

The technical problems associated with a yield threshold were recognized by the sides in the spring of 1974. In this context the Soviet Union mentioned the idea of some kind of a "mistakes" understanding concerning occasional, minor, unintended breaches. Discussions on the subject of such an understanding took place in the autumn of 1974 and in the spring of 1976. The Soviet Union was informed by the United States that the understanding reached would be included as part of the public record associated with submitting the Treaty to the Senate for advice and consent to ratification. The entire understanding is as follows:

Both Parties will make every effort to comply fully with all the provisions of the TTB Treaty. However, there are technical uncertainties associated with predicting the precise yields of nuclear weapons tests. These uncertainties may result in slight, unintended breaches of the 150 kiloton threshold. Therefore, the two sides have discussed this problem and agreed that: (1) one or two slight, unintended breaches per year would not be considered a violation of the Treaty; (2) such breaches would be a cause for concern, however, and, at the request of either Party, would be the subject for consultations.

The Soviet Union was also informed that while the United States would not consider such a slight, unintentional breach a violation, the United States would carefully review each such breach to ensure that it is not part of a general attempt to exceed the confines of the Treaty.

The understanding in its entirety was included in the transmittal documents which accompanied the TTB Treaty and the PNE Treaty when they were submitted to the Senate for advice and consent to ratification on July 29, 1976.

Although the TTBT was signed in 1974, it was not sent to the U.S. Senate for advice and consent to ratification until July 1976. Submission was held in abeyance until the companion Treaty on underground nuclear explosions for peaceful purposes (PNET) had been successfully negotiated in accordance with Article III of the TTBT.

For many years, neither the United States nor the Soviet Union ratified the TTBT or the PNE Treaty. However, in 1976 each party separately announced its intention to observe the Treaty limit of 150 kilotons, pending ratification.

The United States and the Soviet Union began negotiations in November 1987 to reach agreement on additional verification provisions that would make it possible for the United States to ratify the treaties. Agreement on additional verification provisions, contained in new protocols, substituting for the original protocols, was reached in June 1990. The TTBT and PNET entered into force on December 11, 1990. The TTBT verification protocol provides for the use of the hydrodynamic yield measurement method with respect to all tests having a planned yield exceeding 50 kilotons, as well as seismic monitoring and, with respect to all tests having a planned yield exceeding 35 kilotons, on-site inspection.