

More on nuclear treaties 

Pierce Corden



Physics Today **77** (4), 10–11 (2024);
<https://doi.org/10.1063/pt.snvb.gsoq>



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More on nuclear treaties

Hannah Pell's article titled "'Peaceful' nuclear explosives?" (*PHYSICS TODAY*, November 2023, page 34) is informative about the US Atomic Energy Commission's Project Plowshare, which sought to make use of nuclear explosions in applications such as gas stimulation and the creation of canals and harbors.

Pell reports that the Soviet Union was carrying out a similar program. She also makes note of the 1963 Limited Test Ban Treaty, which prohibited nations from conducting nuclear explosions in the atmosphere, underwater, and in outer

space—but not underground, unless the explosion would create radioactive debris outside the territorial limits of the state conducting it.

Later arms-control agreements were also related to nuclear explosions for peaceful purposes. In particular, the US–Soviet Threshold Test Ban Treaty, signed in 1974 and ratified in 1990, prohibited underground nuclear weapons tests that would yield more than the equivalent of 150 kilotons of TNT. The Peaceful Nuclear Explosions Treaty, signed in 1976 and ratified in 1990, in-

cluded the same stipulation for all individual nuclear explosions.

The Comprehensive Nuclear-Test-Ban Treaty, which opened for signatures in 1996 and has not yet come into force, calls for the prohibition of all nuclear explosions, regardless of yield or stated purpose. It now has 187 signatories, 177 of whom have ratified the treaty and become parties to it. The treaty provides for review conferences that "take into account any new scientific and technological developments" relevant to it. Such conferences would consider, at the



A meeting on the Comprehensive Nuclear-Test-Ban Treaty at the United Nations Headquarters in New York City in 2016. (Courtesy of the US State Department/public domain.)

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“Peaceful’ nuclear explosions seem unlikely to have a future on our planet.”

request of any nation, allowing underground nuclear explosions to be conducted for peaceful purposes. If a consensus is reached to allow such explosions, the treaty says, the conference should then recommend an amendment “that shall preclude any military benefits of such nuclear explosions.”

But the preclusion of military benefits seems impossible, and the requirement for consensus among the parties seems to be a substantial obstacle for amendment. “Peaceful” nuclear explo-

sions seem unlikely to have a future on our planet.

Pierce Corden
(pierce.corden@yahoo.com)
Bethesda, Maryland



Something not mentioned in Hannah Pell’s article “‘Peaceful’ nuclear explosives?” (PHYSICS TODAY, November 2023, page 34) is that the work of Project Plowshare and its Soviet counterpart became an issue during the negotiations over the Nuclear Non-Proliferation Treaty (NPT), which entered into force in 1970.

Concerned about getting left out of an important technology, non-nuclear-weapons countries insisted that the treaty guarantee them access to the benefits of peaceful nuclear-explosion applications—and indeed, the NPT’s Article V covers that point. But the lines between peaceful and nonpeaceful explosions are blurry, as evidenced, for example, by India saying that its 1974 nuclear test was a peaceful explosion.

Although Article V hasn’t been removed from the treaty in an official manner, it has been in essence. As stated by the National Security Archive’s William Burr, Article V “has been virtually a dead letter because of the basic U.S. government policy that explosive devices were the same as nuclear weapons and involved the same risks to public health and safety.”¹

That brings me to a vital point regarding the motivation for Project Plowshare. In 1964 I was in a group of young scientists

who received a briefing on it from the director of the Livermore branch of the University of California Radiation Laboratory (now Lawrence Livermore National Laboratory). He confided that the real reason for Plowshare was not economics. Rather, it was that it offered an opportunity for the public to become acquainted with nuclear explosives and more comfortable with their effects—so that in wartime, the president could more easily release nuclear weapons for use in battle.

Reference

1. W. Burr, *The Nuclear Non-Proliferation Treaty and the Mexican Amendments: The Negotiating Record*, Briefing Book 629, National Security Archive (24 May 2018).

Victor Gilinsky
(victor@gilinsky.com)
Santa Monica, California

Little quarks

Little bitty quarks
whirling inside the proton
we can’t set you free

Mac Mestayer
Spring 2021


Correction

March 2024, page 38—Project Vista was mischaracterized as being focused on strategic nuclear weapons. It was focused on tactical nuclear weapons to defend Europe. PT

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