



Why resuming the testing of nuclear weapons is not a good thing 2020 WILPF Solidarity Season Resource Guide 19

WHAT IS A NUCLEAR WEAPON TEST?

A nuclear weapon test is an experiment carried out to determine the effectiveness, yield, and explosive capability of a nuclear weapon. There are many styles of nuclear weapons; conducting an explosive test with a particular warhead won't guarantee that other warheads of the same class will behave the same way. Testing nuclear weapons offers practical information about how the weapons function, as well as how detonations are affected by different conditions; and how personnel, structures, and equipment are affected when subjected to nuclear explosions.

Nuclear weapons have been tested in all environments since 1945: in the atmosphere, above the atmosphere, underground and underwater. Tests have been carried out onboard barges, on top of towers, suspended from balloons, on the Earth's surface, more than 600 metres underwater and over 200 metres underground.

TWO MAIN TYPES OF NUCLEAR BOMBS/WEAPONS

Here is a short explanation of the two main types of nuclear bombs and the various names given to them. The bombs dropped on Hiroshima and Nagasaki are called "A-bombs" where the A stands for atomic, but that is a misleading name as the energy of the explosion comes out of the splitting of the *nucleus* of either a uranium atom (Hiroshima) or a plutonium atom (Nagasaki). So the A bomb is also called a fission bomb.

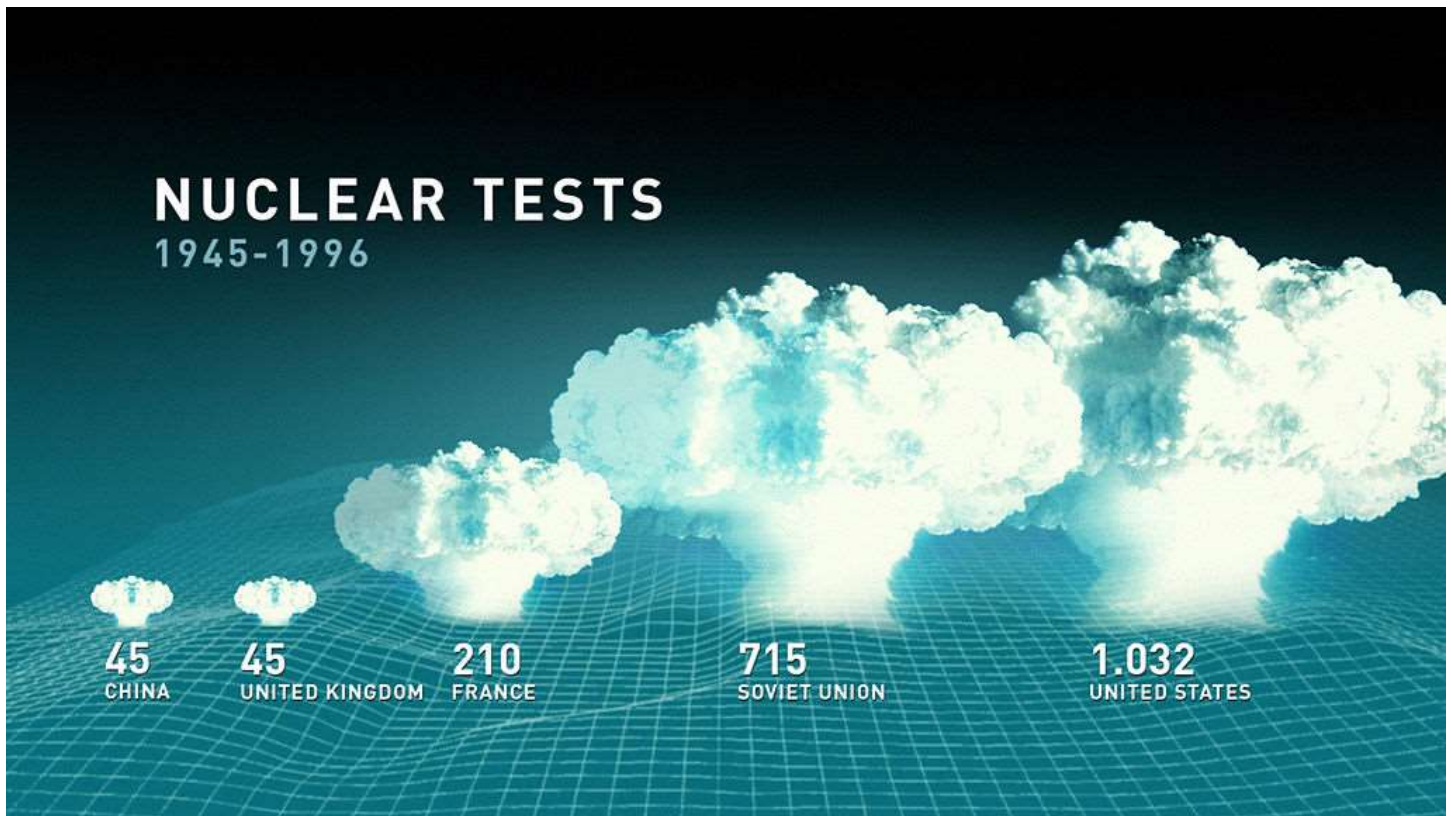
Even though President Truman and the leaders of the United Kingdom and Canada called for the elimination of "atomic" weapons, starting in November 1945, the USA continued to carry out research and development of a different kind of nuclear bomb, called an H-bomb, where H stands for hydrogen. In this H-bomb hydrogen nuclei are fused together in such a way as to release energy, even greater amounts than the fission type. So the H-bomb is also called a fusion bomb and because high temperatures are required for the fusion reactions to occur it is also called a thermonuclear bomb.

The first thermonuclear bomb was tested in November 1952 and no matter what succeeding US Presidents have said about wanting to use nuclear energy to produce electricity the USA has never stopped developing and making nuclear weapons since 1945. All the nuclear bombs currently in the USA's arsenal are H-bombs.

Unit for describing the explosive energy of a bomb

A commonly used chemical explosive is Trinitrotoluene, which we all call TNT. The unit of energy that physicists have defined is called a joule. They determined that an exploding ton of TNT would release 4.184 gigajoules (= a heck of a lot of energy). The first nuclear weapons designers decided to use the "TNT equivalent" to express how much explosive energy their nuclear bombs would release. This convention continues, it allows one to compare the destructiveness of a nuclear event with that of traditional explosive materials. So the Hiroshima bomb was designed to be equivalent to 15 kilotons of TNT.

The Trinity test bomb exploded in the New Mexico desert on 16 July 1945 was the first ever nuclear test. It surprised its designers with an estimated 21 kilotons of energy (see <https://www.vtwilpfgathering.com/trinity-first-test>, for more details about how A-bombs are made, the Manhattan Project and the Trinity test.)



HOW MANY NUCLEAR TESTS HAVE BEEN CARRIED OUT AND BY WHICH COUNTRIES?

The graphic image above gives you a quick over view of how many nuclear bombs have been exploded and by which countries. It omits the smaller numbers exploded by India (6), Pakistan (6) and North Korea (6)

There are several websites where you can read about all these nuclear tests and other nuclear weapon stories, sometimes along a timeline or in tables where tests are listed by country. But don't be distracted from reading this resource guide by going to these 3 websites. Please keep on reading the text.

<https://www.atomicheritage.org/history/timeline> then click on "history" and scroll down to 1960 to 1991 heading.

<https://www.armscontrol.org/factsheets/NuclearTestingTimeline>

https://en.wikipedia.org/wiki/List_of_nuclear_weapons_tests

EXACTLY WHERE HAVE THESE TESTS BEEN CARRIED OUT?

Not where you might have assumed when you see that France, for example, has made 210 explosive tests of its nuclear bombs. Seventeen of these tests were carried out in the Algerian part of the Sahara Desert between 1960 and 1966. Algeria was a French colony in 1960. Some of the contaminated toxic waste was buried somewhere in the desert under the sand and the local tribes want to know exactly where and get it cleaned up (Ref #1). In the 1960s, the Algerian Independence War forced France to move their nuclear tests out of the Sahara Desert. The new location chosen for the tests was French Polynesia (FP), in particular, the Mururoa

and Fangataufa atolls in the Tuamotu Archipelago. Around 190 tests were carried out in this Pacific archipelago over thirty years, affecting the environment and health of thousands for local dwellers (Ref #2).

The United Kingdom conducted 12 major nuclear weapons tests in Australia between 1952 and 1957. The first British hydrogen bombs were tested during the late 1950s at Malden Island and Kiritimati Island in the Pacific Ocean. (Ref #3)

You will know that the USA tested its nuclear weapons in the state of Nevada (900 tests) and you get one guess as to where else the USA conducted 100 other nuclear tests? Yes, small islands in the Pacific Ocean called the Marshall Islands, specifically the Enewetak Atoll (43), Bikini Atoll (23), Kiritimati Island (33 including nine tests conducted by the United Kingdom) and Johnston Atoll (12). The 67 nuclear bombs exploded in Enewetak and Bikini over 12 years (1946-1958) amounted to 108 Megatons, which is equivalent to 1.6 Hiroshima sized bombs being exploded **every** day during that period. The Marshallese had been forced to leave some of their islands during the testing period; residents of Bikini Atoll resettled in 1969, but then evacuated in 1978, after radiation levels were determined to be excessive. Even now, 60 years later, the Marshallese cannot farm their previously fertile islands because of the radioactivity of the soil and so are obliged to import most of their food, which tends to be processed and canned. See the articles listed in ref #4 for more details about the nuclear weapons testing and attempts at clean-up in the Marshall Islands.

Another part of the world that had nuclear weapons testing forced on them, which deserves our attention is the country of Kazakhstan. While Kazakhstan was a Soviet controlled state in the USSR 450 nuclear tests were carried out over 40 years (1949-89) in the so-called Semipalatinsk Polygon region, it has an area of 18,500 square kilometers, the same size as a small country. Residents in the surrounding area became unwitting guinea pigs, exposed to the aftereffects of the bombs both intentionally and unintentionally. The radiation has silently devastated three generations of people in Kazakhstan - the total number affected is thought to be 1.5 million - creating health problems ranging from thyroid diseases, cancer, birth defects, deformities, premature aging, and cardiovascular diseases.

Upon gaining its independence in late 1991 Kazakhstan was burdened with over a thousand Soviet nuclear weapons which it gave up to Russia to become a nuclear-free state. Having fully experienced the horrors of nuclear weapons it ratified the Treaty on the Prohibition of Nuclear Weapons in August 2019. For more details see the articles in ref #5.

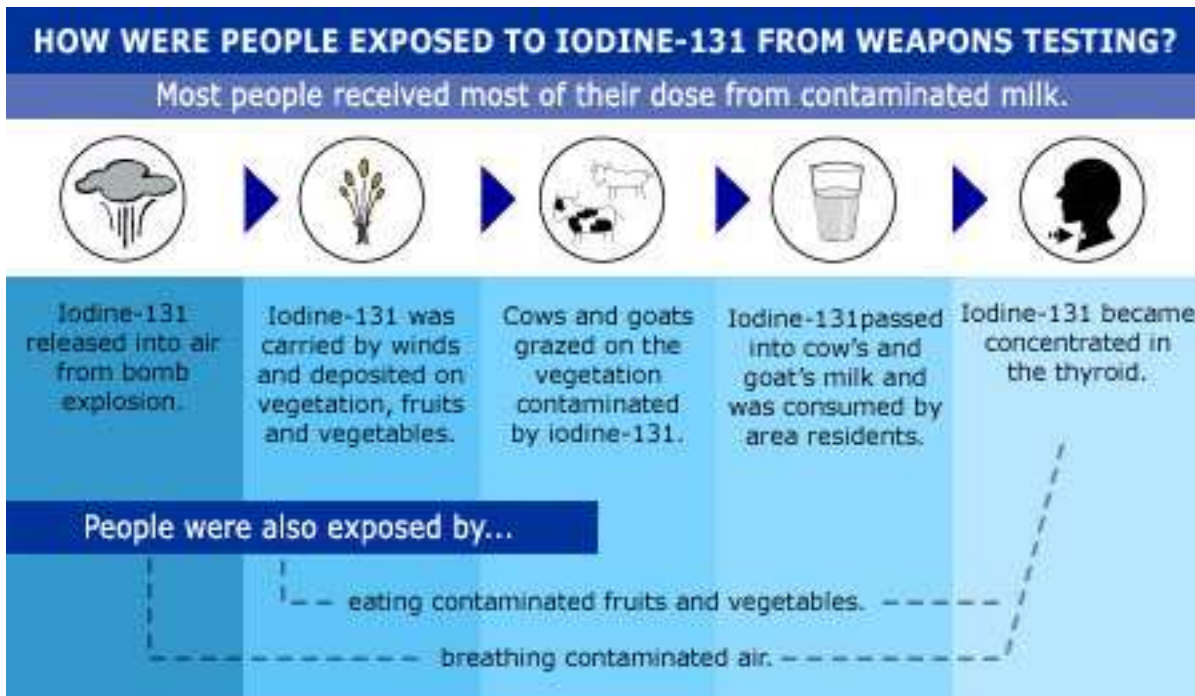
Vulnerability of indigenous populations in Australia – an example of how indigenous peoples have suffered disproportionately from nuclear testing

Authorities paid little or no attention to the vulnerability of indigenous people to the radiological effects of the tests. Factors such as inadequate clothing, ingestion of food contaminated with radioactive material, movement patterns, language barriers (many indigenous people could not read the English warning signs), and general health status rendered them susceptible to the effects of nuclear testing. In addition, Aboriginal people usually lacked amenities such as piped water, hard permanent dwellings with dust proofing, and bathroom and drainage facilities, which would have afforded them more protection from the fallout. The Maralinga Tjarutja people were displaced from their land before the tests, but were still exposed to radioactive fallout because some groups had not been found (they are nomadic) and were still in the test area and others were moved not that far away. Read reference #3 to learn about the effects of the “Black Mist” on the aboriginal peoples and the direct impacts of the Kiritimati Island nuclear explosion on nearby British military personnel and on the health of the children they fathered later (Ref #3).

To learn more about the above-mentioned nuclear tests in the colonies of the five permanent members of the UN Security Council read the online article listed in ref #6.

WHAT WERE THE EFFECTS OF THE 528 ATMOSPHERIC NUCLEAR TESTS ON THE WORLD?

The increasing explosive force of the H bombs being tested above ground, even though they were “far away” on small Pacific Islands, caused enough radioactive dust to be carried high up into the atmosphere, that the jet streams carried the dust all around the globe. The diagram below (from the ctbto.org website listed in ref #7) shows what this global fallout did to the milk that was drunk by millions of people, including in the USA.



The websites listed in reference (7) describe other effects of radioactive fallout.

EVOLUTION OF NUCLEAR TEST BAN TREATIES

Limited Test Ban Treaty

A campaign to ban nuclear tests began in 1954 when it became obvious that the radioactive fallout was causing the accumulation of Iodine-131 in people's bodies. It took until 1963 for a partial test ban treaty to be written, also known as the Limited Test Ban Treaty (LTBT), it prohibits nuclear weapons tests in the atmosphere, in outer space, and under water. The LTBT was initially a trilateral agreement between the United States, Soviet Union, and United Kingdom. Signed in Moscow on August 5, 1963, the original signatories sought “an end to the contamination of man's environment by radioactive substances.” Ratified by the United States Senate on September 24, 1963, the LTBT entered into force and opened for signature by other countries on October 10, 1963. 120 countries have since signed it.

By prohibiting atmospheric and underwater testing, the LTBT reduced the amount of radioactive fallout emitted from nuclear explosions. But because underground testing was still allowed it did little to limit the superpower nuclear arms race, but it contributed to slowing proliferation by making nuclear weapons tests much more expensive.

Nuclear Non-Proliferation Treaty (NPT)

The LTBT ushered in a new era of superpower cooperation on nuclear arms control and proliferation. For example, the US and USSR worked with other international nuclear powers to sign the Nuclear Non-Proliferation Treaty (NPT) on July 1, 1968. The US Senate ratified the NPT and it came into force on March 5,

1970, to be renewed by the signatories every 5 years. The NPT included a basic bargain whereby the non-nuclear weapon states agreed to foreswear nuclear weapons in exchange for unfettered access to the peaceful benefits of nuclear energy and a pledge from nuclear weapons states to eventually eliminate their nuclear arsenals. Non-nuclear states thereby agreed to never develop or acquire nuclear weapons and to submit to international inspections of nuclear facilities in exchange for a concerted effort by nuclear powers to limit, reduce, and ultimately eliminate their stockpiles.

Comprehensive Test Ban Treaty (CTBT)

The preamble of the NPT refers explicitly to a comprehensive test ban and to the "determination expressed by the Parties [to the treaty] to seek to achieve the discontinuance of all test explosions of nuclear weapons for all time." Arms control talks continue for many years after the NPT came into force. The USSR imposes a nuclear testing moratorium on itself in 1985 which lasts a few years, then, as the Cold War comes to an end several countries impose on themselves a moratorium on having any more underground nuclear tests. On September 23, 1992 the US conducts its 1,030th—and last—nuclear weapons test explosion, a 20 kiloton detonation at the Nevada Nuclear Test Site, code-named "Divider." On 2 October 1992 President G.H.W. Bush signs into law the Hatfield Amendment establishing a US nuclear testing moratorium. The moratorium is subsequently extended by U.S. President Bill Clinton, first through September 1994 and then through September 30, 1996.

In 1995 the five permanent members of the UN Security Council commit to a comprehensive ban on all nuclear testing in exchange for an indefinite extension of the NPT. The Comprehensive Test Ban Treaty (CTBT) is drawn up and on 24 September 1996 President Clinton is the first world leader to sign the CTBT. Over the next two days, an initial group of 70 other nations including Britain, China, France, and Russia sign the CTBT. As of early November 1997, 148 signatures and eight ratifications had been obtained. The CTBT prohibits "any nuclear weapon test explosion or any other nuclear explosion" and established an international test monitoring and verification system.

But the US Senate has to ratify all treaties for the US to be bound by them and on 13 October 1999 the Senate fails to ratify the CTBT by a vote of 51-48. This is the first security related treaty in 80 years that the Senate has not ratified. The terms of the CTBT state that it will only come into force when certain countries, China, India, Iran, Israel, North Korea, Pakistan, and the United States have ratified the treaty. Twenty-four years later these countries have not yet ratified the CTBT and therefore it is not in force.

Nevertheless the USA has not carried out any explosive nuclear tests since 1992. Nuclear testing has essentially become a "taboo", with only North Korea having carried out any test since 1998. See reference #8 for details of all the test ban treaties.

HOW CAN THE US BE SURE THAT ITS AGING NUCLEAR WEAPONS WILL WORK IF NEEDED?

The US carried out over one thousand explosive nuclear tests during 36 years, they tested all kinds of H-bombs in many different circumstances with many detectors and instruments to record what happened during each test. Through nuclear test explosions, the US and other nuclear testing nations have been able to proof-test new warhead designs and create increasingly sophisticated nuclear weapons. The overwhelming majority of the nuclear weapon test detonations were for "weapons development" and "weapons effects" purposes. Large supercomputers at some US national labs (such as the Lawrence Livermore National Laboratory, LLNL) run elaborate computer programs to simulate what will happen if a certain style of a nuclear weapon is triggered. These simulation programs use data from the old explosive tests and from more recent experiments which actually "blow up" a modified warhead which has all the components of that style of bomb but does not contain enough materials to start a nuclear chain reaction.

Since the start of the US's moratorium on any nuclear testing in 1992 the US has had a massive program, overseen by the Department of Energy, called the Stockpile Stewardship Program, which maintains the safety and reliability of the US's nuclear weapons. Since 1996, based on the analysis of the data in the above-mentioned simulations and experiments, annually, the directors of the three weapons labs (LLNL, Los Alamos National Lab and Sandia National Lab) have to certify to Congress that no explosive nuclear tests are needed to confirm the reliability, safety or military effectiveness of any warhead. Which they have done.

Their analyses are reviewed by other expert scientists and engineers every few years; e.g. a 2012 report by the National Academy of Sciences which reaffirms that the United States no longer needs—and would not benefit from—nuclear explosive testing and also cites substantial advances in the U.S. national monitoring and the International Monitoring System capabilities across all of the key verification technologies deployed worldwide to detect and deter nuclear tests (read about monitoring for nuclear tests further down in this resource guide). Further information on the Stockpile Stewardship Program and the National Nuclear Security Administration (NNSA) that runs it can be found through links in reference #9.

WHAT HAS HAPPENED SINCE APRIL 2020 WITH REGARD TO NUCLEAR WEAPONS TESTING

In April 2020 a (later newspaper) report says Federal administration officials have accused Russia and China of conducting low-yield nuclear tests — an assertion that has not been substantiated by publicly available evidence and that both countries have denied. The claim that Russia has carried out some 0.0001 kiloton “hydronuclear” tests sometime since 1995 is physically unverifiable. Accusations of Russia of breaking the Open Skies Treaty and the Intermediate Nuclear Forces (INF) Treaty were used as excuses by the Trump administration to abandon those treaties.

On May 15, 2020 at a meeting of senior U.S. officials representing the top national security agencies, Trump administration officials discuss the possibility of resuming U.S. explosive nuclear weapons testing. One senior official stated that the proposal to renew U.S. nuclear testing is “very much an ongoing conversation.” John Bolton said testing had been (secretly) discussed in the US National Security Council for two years.

Non-profit organizations that focus on arms control and nuclear disarmament immediately started writing opinions against this possible resumption and getting the public to contact their Congressional representatives to vote against it. But that does not stop the Senate Armed Services Committee from voting (on 15 June) to include \$10 million in the Fiscal Year 2021 National Defense Appropriations Act (NDAA) for testing “if necessary”. Such a test could be conducted underground in just a few months at the former Nevada Test Site outside Las Vegas. The House sprang into action and on 20 July voted for an amendment to the NDAA to prohibit funding from being used “to conduct or make preparations for any explosive nuclear weapons test that produces any yield” (led by McAdams (UT) and Titus (NV), states that would suffer from new explosive nuclear tests). A House-Senate conference to reconcile their differences in the NDAA has not yet been set up (as of 15 September 2020). Which situation leads to actions you WILPFers can do in the next few weeks as described further down in this resource guide.

SOME REASONS WHY RESUMING EXPLOSIVE NUCLEAR TESTING IS A TERRIBLE IDEA

Extracted from Daryl Kimball's article reached through reference # 10:

“The idea of such a demonstration nuclear test blast is beyond reckless. In reality, the first U.S. nuclear test explosion in 28 years would do nothing to rein in Russian and Chinese nuclear arsenals or improve the environment for negotiations. Rather, it would raise tensions and probably trigger an outbreak of nuclear testing by other nuclear actors, leading to an all-out global arms race in which *everyone* would come out a loser.

Other nuclear-armed countries, such as Russia, China, India, Pakistan, and North Korea would have far more to gain from nuclear testing than would the United States. Over the course of the past 25 years, the U.S.

nuclear weapons labs have spent billions to maintain the U.S. arsenal without nuclear explosive testing. Other nuclear powers would undoubtedly seize the opportunity provided by a U.S. nuclear blast to engage in multiple explosive tests of their own, which could help them perfect new and more dangerous types of warheads.”

Extracted from the statement of the Annual Meeting of the Abolition 2000 Global Network to Eliminate Nuclear Weapons; agreed upon by many organizations on 23 May 2020 (ref #11):

“Resumption of nuclear explosive testing is absolutely unacceptable. Even discussing nuclear testing again is dangerously destabilizing. US resumption of nuclear testing would lead to testing by other states - possibly China, Russia, India, Pakistan, and DPRK. It would accelerate the emerging nuclear arms race, and damage prospects for nuclear arms control negotiations. A nuclear explosive test is itself a kind of threat. Testing would generate fear and mistrust and would entrench reliance on nuclear arms. It would move the world away from rather than towards a world free of nuclear weapons.”

The International Day against Nuclear Tests is observed annually on 29 August. This year the UN Secretary General, António Guterres, issued a message in which he warns of a resurgent nuclear menace and calls for a complete ban on testing. Here is one sentence from his message: “A complete ban on nuclear testing is an essential step in preventing the qualitative and quantitative improvement of nuclear weapons and in achieving nuclear disarmament”. His message can be found here: <https://www.un.org/press/en/2020/sgsm20220.doc.htm>

HOW DO OTHER COUNTRIES KNOW WHEN A COUNTRY HAS ILLICITLY SET OFF A NUCLEAR BOMB OR HAS HAD A NUCLEAR ACCIDENT?

In order for the Comprehensive Test Ban Treaty (CTBT) to work there is an extensive series of radiation detectors placed all over the globe which are monitored continually by the Comprehensive Test Ban Treaty Organization (CTBTO) and these sensitive instruments can detect when certain radioactive isotopes appear in the atmosphere in greater concentrations than usual. Underground nuclear explosions are detected by CTBTO seismographs, again situated all over the globe, which are usually recording earthquakes. When the familiar oscillatory signals appear on seismographs the seismologists can tell if it is a natural earthquake or an underground explosion, and where it happened. This system is called the International Monitoring System.

Here is a recent article which describes some mysterious atmospheric radioisotopes detected in northern Europe in June 2020, and through describing this incident the author explains how the data is typically acquired, analyzed and conclusions drawn: <https://thebulletin.org/2020/08/radiation-detections-in-northern-europe-what-we-do-and-dont-know/>?

ACTIONS THAT WILPF MEMBERS SHOULD TAKE TO PREVENT THE PROPOSED NUCLEAR TEST IN NEVADA FROM HAPPENING

By your reading of the above sections of this resource guide the author hopes you have come to appreciate why explosive nuclear test must never be allowed to happen again, anywhere, and that decisions about to be made in the US Congress will determine whether the US will resume testing or not. We must make the case that Congress must take nuclear testing off the table next year, and in the years ahead through additional legislation and by finally ratifying the Comprehensive Test Ban Treaty (CTBT).

We need to write letters to the members of the House and Senate Armed Services Committees to argue against the \$10 million that is in the Senate version of the FY 2021 NDAA. You need to ascertain if any of your Congressional representatives are on either committee, because your letters will wield the most influence. Check these lists of said committees’ members:

https://en.wikipedia.org/wiki/United_States_House_Committee_on_Armed_Services#Members,_116th_Congress and <https://www.armed-services.senate.gov/about/members>

It is best to write an email to your rep using their website e-mail portal, using some of your own words. Keep a copy of what you wrote on your computer. Here are the points to be made; you don't have to include them all:

- Resuming nuclear testing would be nuclear nonproliferation malpractice
- A resumption of U.S. nuclear testing, for any reason, would increase incentives for other nuclear-armed states to conduct their own tests
- The United States does not need nuclear test explosions to ensure the reliability of its nuclear arsenal
- Public opinion polling continues to show that overwhelming majorities oppose the resumption of nuclear testing
- Over the years, nuclear testing has killed or sickened thousands of US military personnel and US residents (let alone millions more people all over the world)
- A resumption of U.S. testing would violate the global taboo against nuclear testing established by the 1996 Comprehensive Test Ban Treaty
- Safeguards should be put in place to ensure that no president may resume U.S. nuclear testing for any purpose, without a clear reason, adequate debate, or Congressional approval

Summaries of the reasoning underlying each point can be found here: <https://www.armscontrol.org/issue-briefs/2020-07/congress-should-take-nuclear-testing-option-table> and in the rest of this resource guide.

We don't know how soon this House-Senate conference on the NDAA will happen, so best to write to your rep before 22nd September.

If your Congressperson or Senators are not on an Armed Services Committee you could use the information in this resource guide to write an Op-Ed for your local newspaper. Your chances of it being published will be enhanced if you can find a local connection to the history of nuclear testing, such as a veteran who was present at any of the Marshall Islands tests, or who worked on the efforts to de-contaminate Enewetak Atoll.

REFERENCES FOR FURTHER READING AND DEEPER UNDERSTANDING

- (1) <https://www.rfi.fr/en/wires/20200826-france-must-clean-algerian-nuclear-test-sites-group>
- (2) <https://ejatlas.org/conflict/french-nuclear-tests-in-polynesia>
- (3) <https://www.ctbto.org/nuclear-testing/the-effects-of-nuclear-testing/the-united-kingdomsnuclear-testing-programme/>
- (4) Articles about the nuclear testing in the Marshall Islands and what is happening there now:
<https://www.latimes.com/projects/marshall-islands-nuclear-testing-sea-level-rise/>
https://en.wikipedia.org/wiki/Castle_Bravo
<https://www.atomicheritage.org/location/marshall-islands>
- (5) Articles and videos about nuclear weapons testing in Kazakhstan and what is happening there now:
<https://voicesoncentralasia.org/humans-of-the-polygon-travel-notes-from-the-land-of-abai-karaul-znamenka-kokentau-sarzhai/>
<https://tedxbeaconstreet.com/videos/seeking-truth-kazakhstans-fight-against-nuclear-testing/>
- (6) An academic article describing the history of nuclear weapon testing by the major nuclear powers during the Cold War shows it is intimately tied to the history of military colonialism in the 20th century, is free to read:
https://www.researchgate.net/publication/280775319_Nuclear_Conquistadors_Military_Colonialism_in_Nuclear_Test_Site_Selection_during_the_Cold_War

(7) These three websites describe the effects of radioactive fallout on human health:

<https://www.ctbto.org/nuclear-testing/history-of-nuclear-testing/world-overview/>

https://www.cdc.gov/nceh/radiation/fallout/rf-gwt_home.htm

<https://www.epa.gov/radtown/radioactive-fallout-nuclear-weapons-testing>

(8) List and short descriptions of all the nuclear test ban treaties:

<https://www.atomicheritage.org/history/nuclear-weapon-test-bans?platform=hootsuite>

(9) <https://theconversation.com/a-restart-of-nuclear-testing-offers-little-scientific-value-to-the-us-and-would-benefit-other-countries-141168>

(10) <https://www.armscontrol.org/act/2020-07/focus/nuclear-testing-never-again> Statement authored by Daryl G. Kimball, Executive Director, Arms Control Association

(11) <http://www.abolition2000.org/wp-content/uploads/2020/05/20200523-Statement-regarding-threatened-resumption-of-nuclear-testing.pdf> and

<http://www.abolition2000.org/en/news/2020/05/25/absolutely-unacceptable-resumed-nuclear-explosive-testing/>

BONUS FOR ANYONE WHO HAS READ TO THE END OF THIS RESOURCE GUIDE

Ray Acheson, Director of WILPF's Reaching Critical Will, was awarded a 2020 Nuclear Free Future Award in the category "solution" and she recorded an 8 minute acceptance interview which you can watch here: <https://www.youtube.com/watch?v=kczTSIFCXG8&feature=youtu.be> In this interview, Ray outlines the connections between the movement to abolish nuclear weapons and other movements for feminist peace and racial justice. She also remarks on who suffered most from explosive nuclear weapons testing.