

NUCLEAR WEAPONS



How did we get them?

How have we used them?

How many are there, and what is their status?

What are we going to do with them now?

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The truth of this, our nuclear weapons empire, is beyond anything imagined by George Orwell or H G Wells. It is a story loaded with unintended consequences:

- born of a fear of Hitler's atom bomb, which never existed
- driven by 70 years of fear of a Russian first strike, which never happened
- fueled by money, uncounted billions of dollars in defense contracts, that has built and fed the enormously powerful military-industrial complex that President Eisenhower warned us about, and which rooted itself so deeply in our national consciousness that we have come to believe we can't live without it.



How it began:

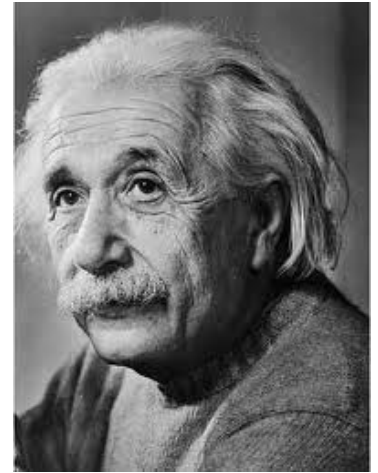
1939, Szilard and Einstein send a letter to Roosevelt



Leo Szilard



President Franklin Roosevelt



Albert Einstein

We have all heard the story before, so I will not repeat all the details. Physicist Leo Szilard and other scientists had been pursuing theoretical research into nuclear physics, a new field in the 1930s, and they were beginning to understand the mechanisms of nuclear decay, when it became apparent that atomic fission released potentially huge amounts of energy. The possibility of controlling this process to produce great heat, and subsequent electrical and motive power, and equally powerful, but destructive, explosions, was a shocking realization. Albert Einstein agreed, and after agonizing over whether or not to share these insights outside the scientific community, they approached President Roosevelt with a persuasive argument.

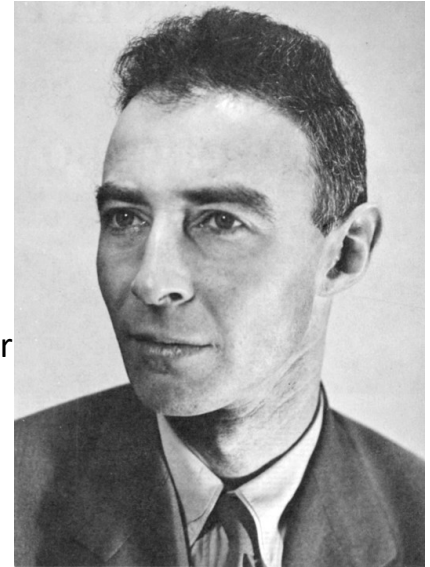
At that time, there were scientists in several countries, including Nazi Germany, doing similar work in nuclear physics, and they were sharing their results and ideas, as is natural among scientists always. It became clear that sooner or later, somebody would discover a method for starting a chain reaction of nuclear fission, accelerating and controlling the process to produce enormously destructive explosives. Such weapons would confer overwhelming military advantage on whichever nation first developed them, and at the time it was feared that if Germany succeeded first, the growing power of Hitler's army would be unstoppable.

In 1939, when the scientists met with the president, the US was not yet at war, but fearful of becoming involved, so his response was to authorize more research, but not start any bomb production yet.

1942: MANHATTAN PROJECT BEGINS



General
Leslie
Groves



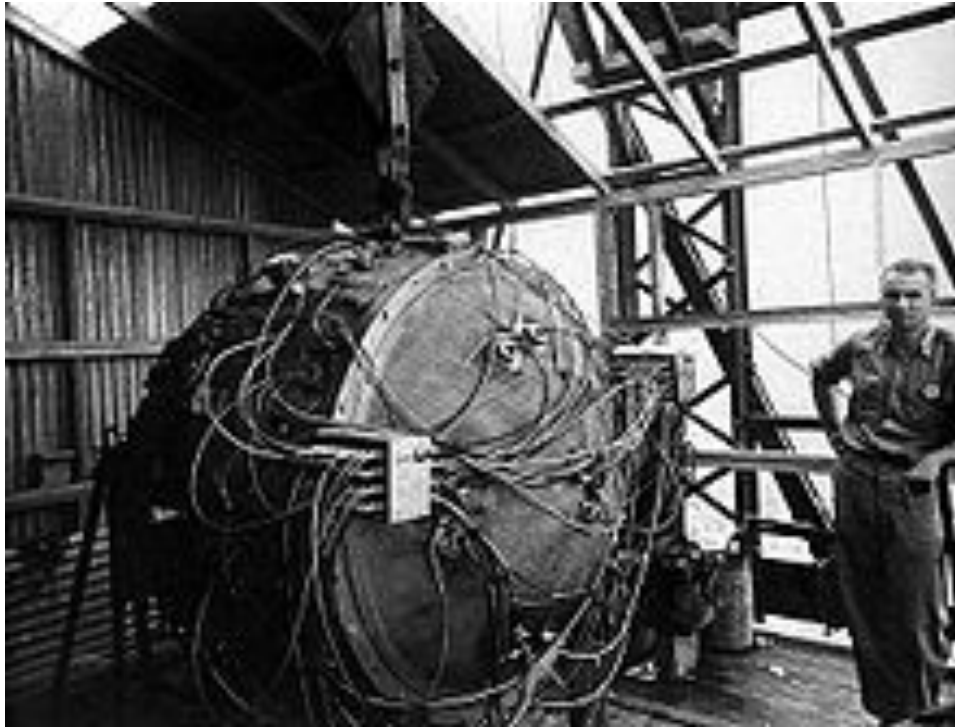
Dr J Robert
Oppenheimer

By the time that the US entered the war, after Pearl Harbor, research was well underway, many of the theoretical problems had been solved, and plans for building nuclear reactors and bombs were ready to be implemented. Also, by then, the fear of Germany's nuclear efforts was reaching hysteria. The Manhattan Engineering District, the government program to build and deploy the atomic bomb, led by General Leslie Groves and Dr Robert Oppenheimer, was officially authorized in August 1942.

That same year, Enrico Fermi's team at Chicago assembled and started the first nuclear reactor, proving the technology of controlled nuclear fission, and providing the means to produce atomic fuel. Industrial nuclear reactors were quickly built in Oak Ridge, Tennessee and Hanford, Washington, and began producing Uranium 235 and Plutonium. A top secret laboratory complex, complete with a town to support it, was built to assemble and test the bomb, at Los Alamos, New Mexico.

The Manhattan Project employed the best physicists in the US, including many who had worked previously in Europe. Engineers and technicians were recruited from US industry and military to support their work, and build the laboratories, the testing facilities, power plants, and weapons that brought the scientific work to military production. By July 1945, with sufficient quantities of weapon grade fuel, the mechanical components for 2 different types of bombs were assembled at Los Alamos. Simultaneously a fleet of B-29 bombers had been outfitted and staffed, and were waiting on their Pacific island base ready to deliver the bombs.

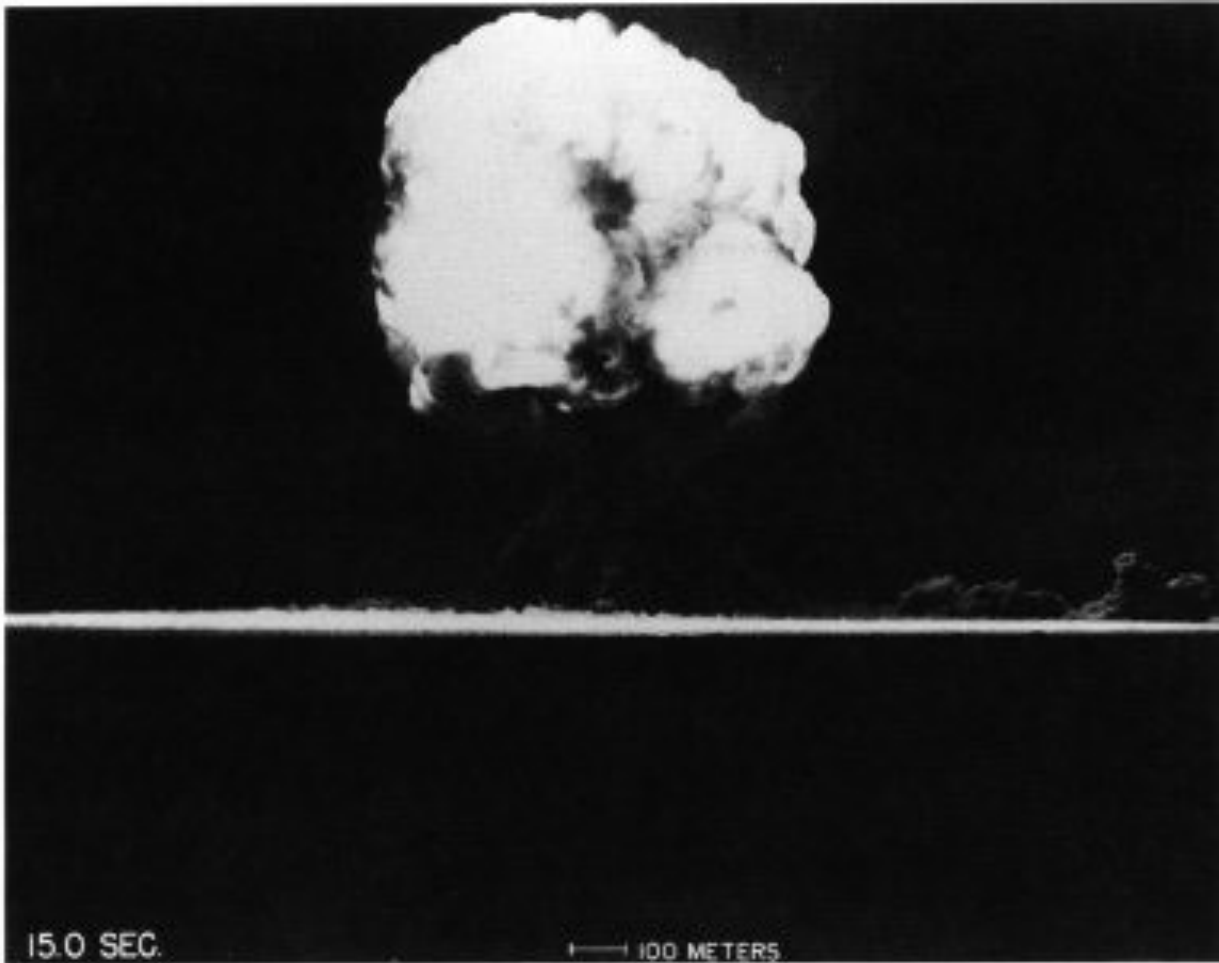
Trinity



The war, and international political environment, had changed a great deal while the bomb was being developed. President Roosevelt had died in April, 1945, and the new president, Harry Truman was still learning about the bomb. Nazi Germany surrendered in May, thus ending the European war, and any threat of a German atomic bomb program, which was soon discovered to have been abandoned years earlier. The motivation for building the bomb in the first place had centered on the fear of a German atomic bomb that never existed. And in the Pacific War, the US firebombing of major Japanese cities had killed hundreds of thousands of people; the small islands offshore had all been taken; Japan's navy and air force were nearly wiped out. Most importantly, the Soviet Union had declared war on Japan, and the Red Army was poised to attack the Japanese mainland. It was known to the US government that Japan was defeated and ready to surrender, but the momentum to build and use the atomic bomb had developed a life of its own. It rolled on relentlessly to its ultimate horrific climax.

July 16, 1945, at Alamogordo, New Mexico, Trinity, the first test of the new atomic bomb took place. It was an implosion type bomb, fueled by conventional explosives and plutonium, roughly spherical, about 5 ft by 8 ft, weighing about 5 tons, and perched atop a steel tower, 100 feet above the sandy desert floor. It was called, among other nicknames, the Gadget.

July 16, 1945



Theoretically, this test would produce an explosion more powerful than any weapon ever made or even conceived of before, but none of the scientists were really sure just what would happen. It was bigger than they expected. When it exploded, it released a burst of energy with the destructive equivalent of 18,000 tons of TNT. The brilliant flash of light was seen over a hundred miles away, and the shockwave shook houses and broke windows that far away as well. The mushroom shaped cloud of fire, dust, and smoke rose 7 miles into the sky. The steel tower, test buildings, and many of the instruments at the site, were incinerated and vaporized, and the sand in the bottom of the blast crater was fused into radioactive glass. Radioactive fallout spread out sixty miles or more, and drifted a hundred miles downwind as it settled to the ground. The most destructive force ever dreamed of by human beings had just been unleashed, and all of the participants were in awe of what they had done.

More, and much worse destruction was to come.

POTSDAM CONFERENCE July 15-28, 1945

US Sec of State

James Byrnes



USSR President

Joseph Stalin



US President

Harry Truman



UK Prime Minister

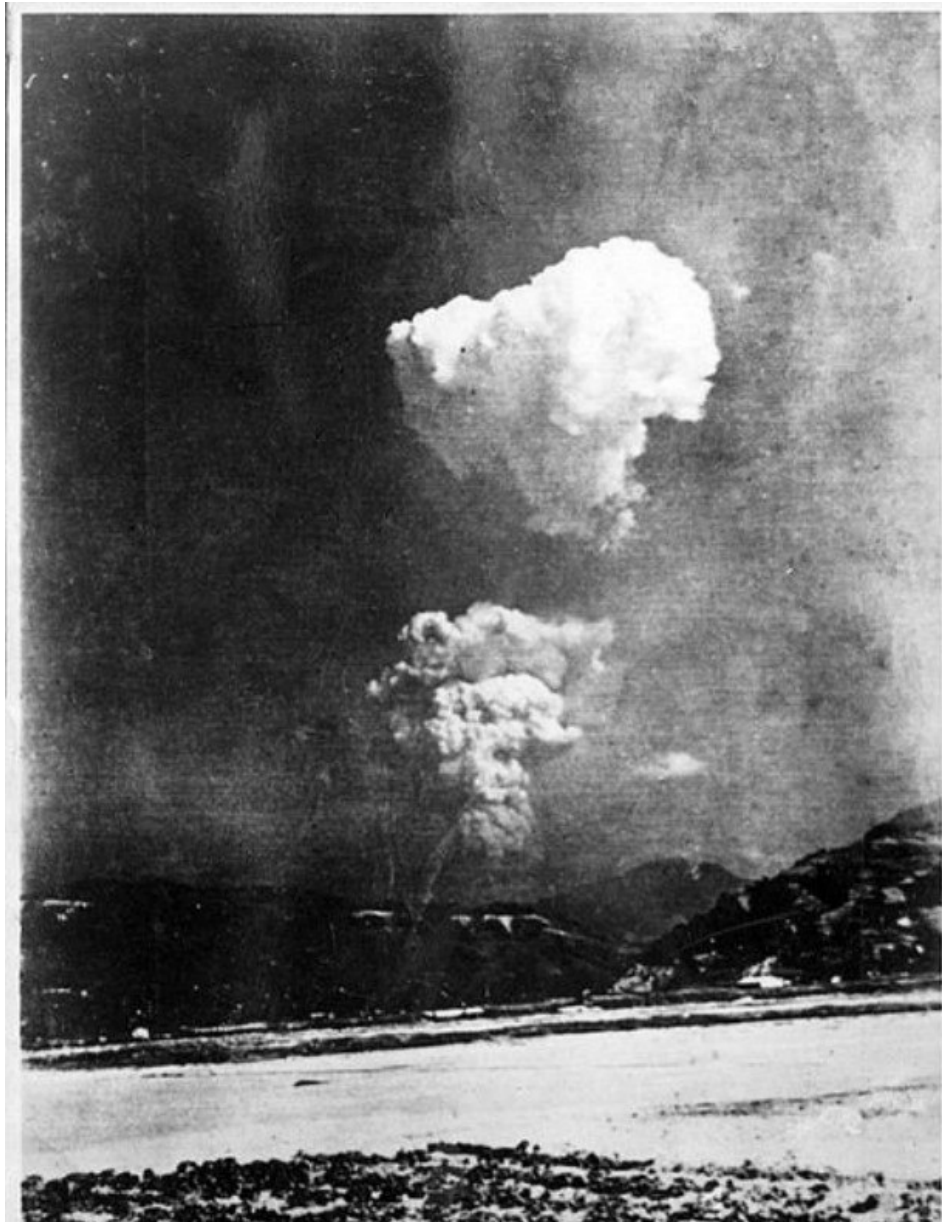
Winston Churchill



The Big Three divide the spoils.

Germany has surrendered. Roosevelt has died. New president Truman meets with the other victors of the European war, to secure the peace there and plan how to defeat Japan. Truman receives word of the successful A-Bomb test at Los Alamos, but doesn't tell Stalin about it. Stalin announces that the Red Army will invade Japan as quickly as it can assemble in Manchuria. Byrnes advises Truman to stall for time, so that the US will be the only victor in Japan. Meanwhile, US firebombing of Japanese cities has devastated the country, and the Japanese naval fleet and air force are shredded. Emperor Hirohito tries to negotiate an end to the war, but Byrnes and Truman demand unconditional surrender, which they know the Emperor will hesitate to do, allowing time to get the A-Bombs to the Pacific.

HIROSHIMA August 6, 1945

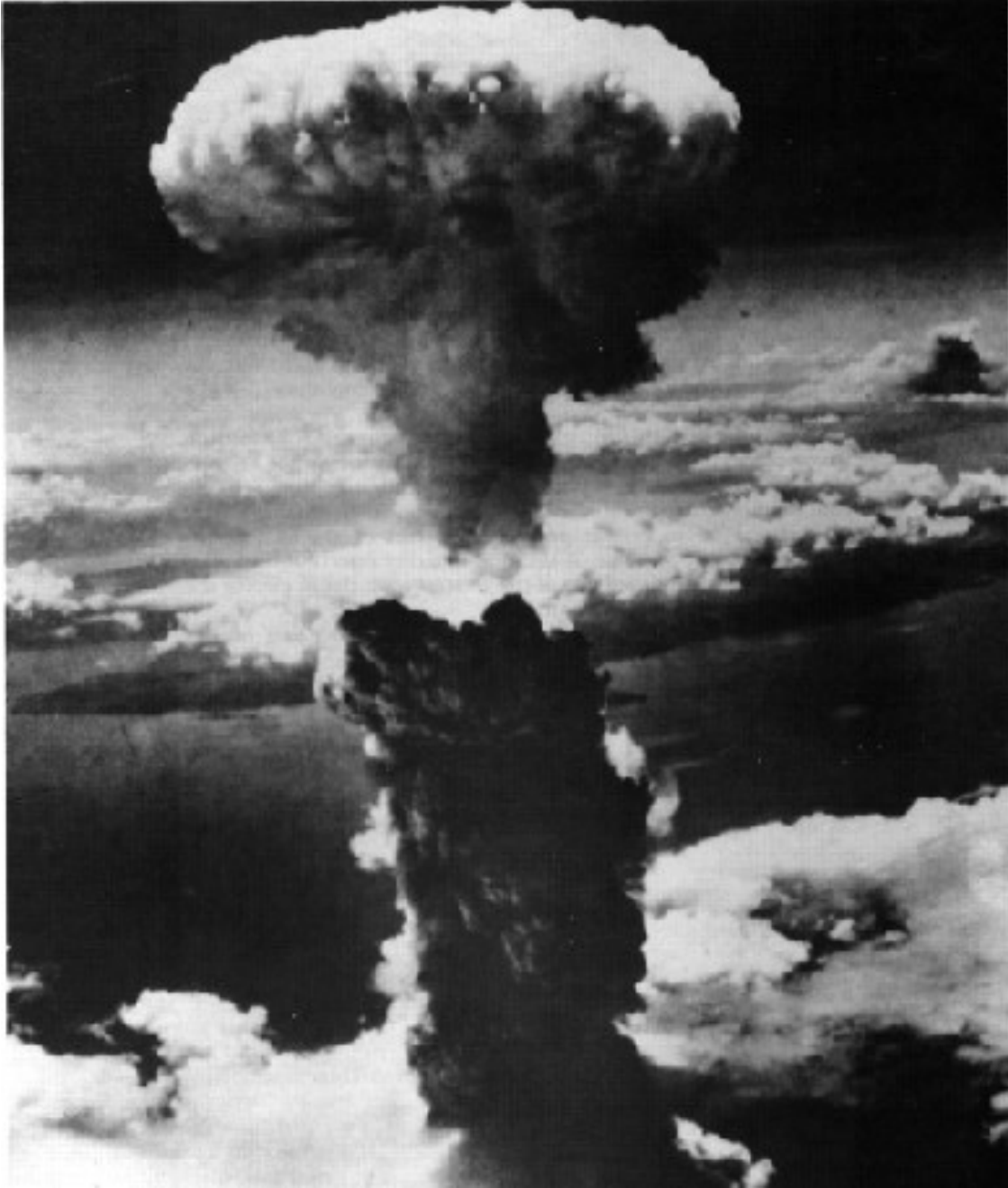


About 9:00, on a Monday morning, Hiroshima was destroyed by a single atomic bomb. Whether or not the dropping of this bomb was necessary to end the war, and this debate will never be settled, over 80,000 human beings were killed, burned and poisoned that morning.

Three days later, because the Japanese Emperor failed to surrender quickly enough, the same gruesome devastation was visited upon Nagasaki. Over 70,000 people were destroyed, and by the end of a year, another 70,000 died of burns and radiation sickness.

The United States of America became the first and only nation to have used the most horrific weapon ever devised. We perfected the science of war, of inflicting the most shocking and indiscriminate torture and death, so swiftly and with such cruel finality, that many of us even now cannot believe it is true, nor comprehend the scope of the human damage caused by these two bombs.

NAGASAKI August 9, 1945



The Hiroshima and Nagasaki bombs were, ironically, the logical conclusion of the Trinity test. The Hiroshima bomb was the first of the gun type, using only U-235, and it had not yet been tested. It was called Little Boy. The Nagasaki bomb was called Fat Man, and was just like the Trinity Gadget, an implosion device, with Plutonium, but the first to be dropped from a plane, rather than statically detonated. There was a third bomb, ready to go at Tinian, but it was not deployed.

Both attacks were also test flights for the newly reconfigured B-29s and their crews, as well as the imaging and scientific monitoring equipment that would be used in later nuclear testing programs.

USSR enters the game



Beginning in 1946, assisted by information leaked by spies working in the US nuclear industry, the USSR quickly caught up, and developed its own rigorous weapons production system. In September 1949, at Semipalatinsk, Kazakhstan, the first Russian nuclear test was a 22 Kiloton blast. Thereafter, the USSR continued to improve its nuclear weapons at an accelerating pace, until it surpassed the US output in the late 1970s.

The race was on.

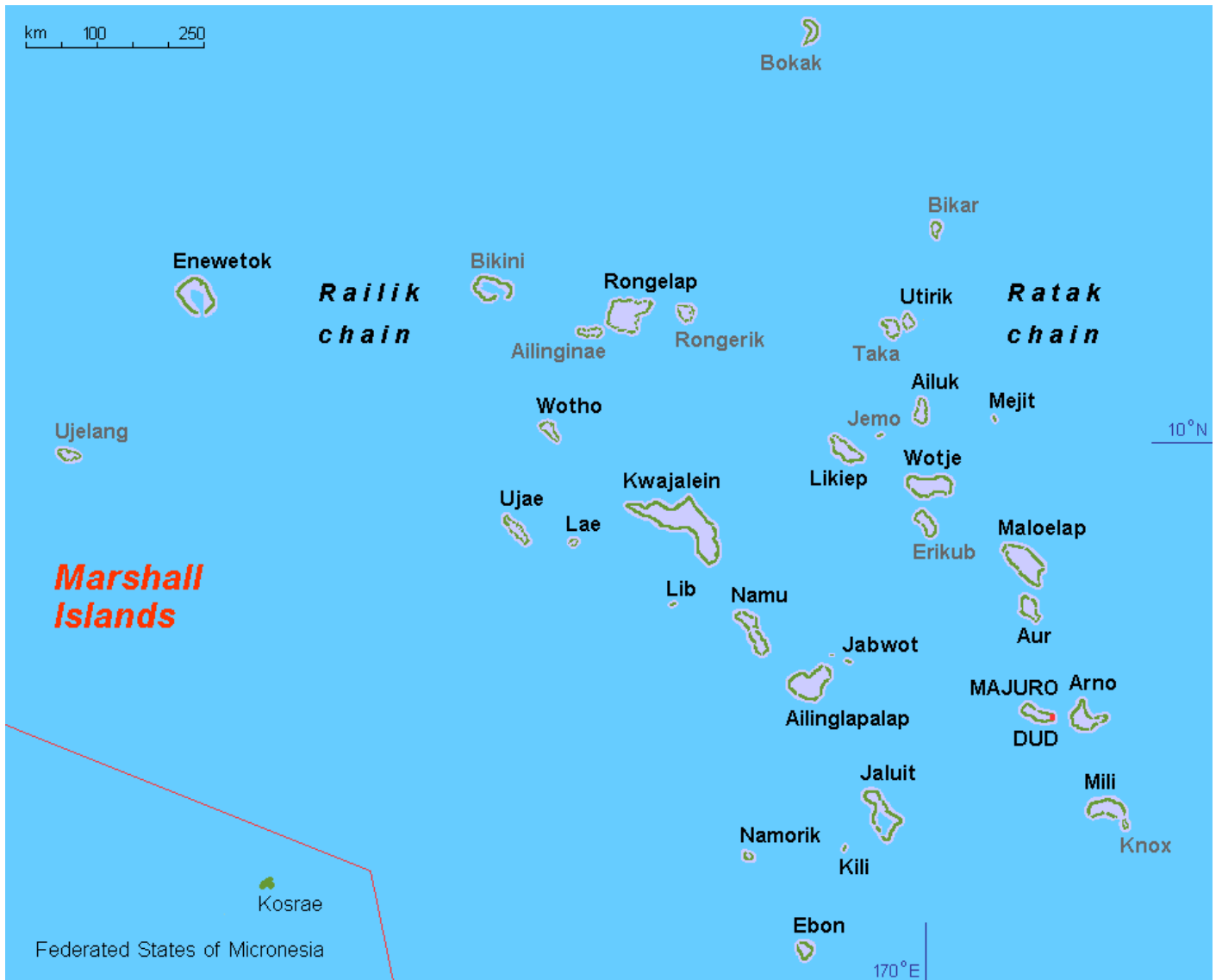
Nuclear Arms Race/Cold War



Able test, Bikini Atoll, 1946

21 Kiloton air burst

As soon as WWII ended, the US accelerated its production of nuclear fuel, atomic bombs, and the military infrastructure for deploying them. While this effort was underway, a whole new generation of nuclear weapons, hydrogen fueled thermonuclear bombs were developed. These bombs would become even more powerful, increasing their destructive equivalent by 1000 times, and simultaneously shrinking new warheads in size, so that several could be fitted onto each missile that could be fired from land, airplanes, and submarines. The USSR was doing the same. All these new weapons required testing, and for this purpose, in 1946, the US acquired the Marshall Islands, an archipelago of 30 atolls covering 576,000 square miles in the Pacific Ocean. From 1946 to 1958, 67 nuclear weapons were exploded there.



Enewetok and Bikini were the test sites, and their people were relocated to Kwajalein, where the US had built a naval base. All the islands in the northern half of the archipelago were repeatedly contaminated by radioactive fallout. Most severe was the 1954 Bravo test which caused the evacuation of the entire populations of Rongelap, Rongerik, and Ailinginae. In 1957 these people were brought back to Rongelap, and told their home island was safe. After 25 years, it was finally revealed that the Rongelapese had been unwitting subjects in medical experiments on radioactive fallout effects, including cancers, birth defects and deaths. They were evacuated in 1985, by Greenpeace, to Majuro. They are even now destitute and sick, refugees scattered all over the Marshall Islands, and Hawaii, and several mainland US states.

The Republic of the Marshall Islands has filed lawsuits in the International Court of Justice, against the nine current nuclear armed nations, for failure to live up to their commitments under the nonproliferation and disarmament treaties they all signed years ago.

Testing in the Marshall Islands continued until 1958



Above is the first thermonuclear test (hydrogen bomb) the Mike shot, Enewetok Atoll, Nov, 1952, 10 Megatons

Below is the largest, and last, Bravo, Mar 1, 1954, Enewetok Atoll, 15 Megatons, or 1000 times the explosive force of the Hiroshima bomb. Radioactive fallout from this blast devastated the island populations, and they have never recovered from the burns, cancers, and birth defects, nor their displacement from their homes.



**TSAR BOMBA, Largest Thermonuclear Test ever,
Oct 30, 1961
Novaya Zemlya, Russian Arctic Island
55 Megaton yield**



Bigger and better bombs required more reactors producing more fuel, more factories, more missiles, more airplanes, more submarines, more technicians and crews, more security, more surveillance and monitoring, and billions of dollars, and rubles.

Besides the Pacific Islands testing sites, the US established an enormous program of nuclear weapons testing at Yucca Flats Bombing Range, Nevada. From 1951 to 1992, there were 100 atmospheric detonations there and over 800 explosions underground.

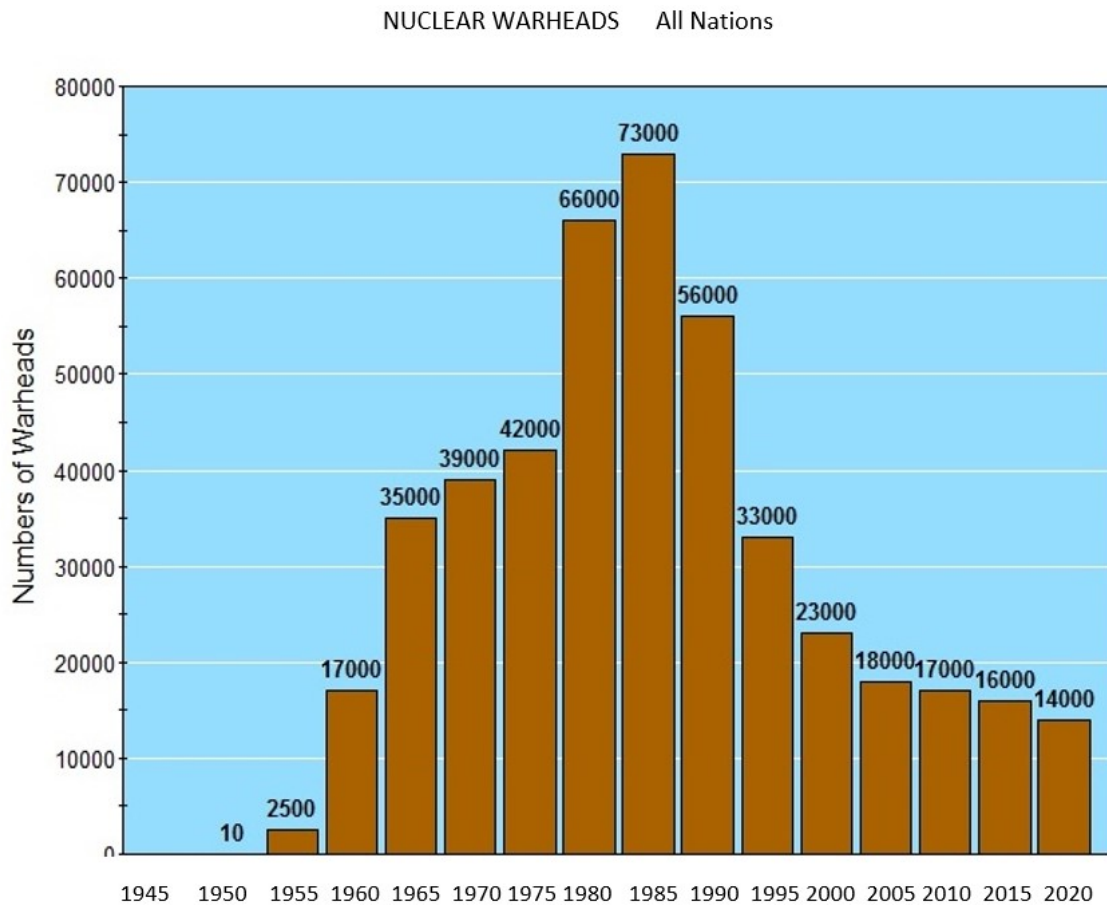
Meanwhile, the USSR was doing the same, and the Nuclear Club expanded to include Britain, France, China, Israel, and later, India and Pakistan.

During the 1960s, Canada, Australia, South Africa, Brazil, and others began to put together their own nuclear weapons programs.

It was the **1970 Non Proliferation Treaty** which allowed them to drop out of the race. The treaty, signed by 190 nations, called for the existing nuclear armed states to share nonmilitary nuclear technology with other states in return for their abandoning their nuclear weapons programs.

ARMS RACE OVER TIME

The US arsenal peaked in late 1960s, USSR at the end of the 1980s, when there were about 73,000 nuclear warheads worldwide



1994, START, or **Strategic Arms Reduction Treaty**, was signed between US and Russia, the first official action to begin to reduce the tremendous numbers of nuclear weapons in the world. It called for mutual verification, and systematic decommissioning and dismantling of existing nuclear weapons on both sides simultaneously, with a goal of achieving parity at an unspecified future date, at 6000 warheads each.

New START, signed in 2011, called for further simultaneous reductions to 1500 warheads each. The US and Russian governments have failed to reach either of these levels, and now, as of 2020, Russia and the US have about 6500 each, and the other nations with nuclear weapons, Britain, France, China, Israel, India, Pakistan, and North Korea have about 1000 among them.

Still enough to destroy all the largest cities on all continents, and potentially render most of the planet uninhabitable for thousand of years.

NEAR MISSES

Since The Manhattan Project began, scientists, engineers, and military personnel have been handling radioactive metals and high explosives, in research and development, and during manufacture, assembly, transport, deployment, and storage of these most dangerous materials and their products. Even before the first bombs were built, accidental radiation exposures were part of the business, and as the bombs became more numerous, and were deployed in more locations around the world, more accidents have been happening. So far, there has not been a full scale accidental detonation within the US nuclear arsenal, but can we be certain our luck will hold forever?

Here are just a few of the hundreds of incidents reported to atomic energy authorities:

- **1956**, a B-47 landing at Lakenheath Air Base, Britain, crashed into a storage hut full of atomic bombs, scattering them across the field. 4 crewmen died in the crash and fire, but none of the bombs exploded.
- **1958**, a B-47 accidentally dropped an H-bomb at Myrtle Beach, South Carolina. The high explosives detonated, but the nuclear core did not.
- **1962**, a B-52 carrying 2 H-bombs crashed at Goldsboro, North Carolina. 3 of the 8 crewmen were killed, one of the bombs came very close to exploding, and one of them is still there, buried deep in the mud, its nuclear core intact.
- **1966**, a B-52 collided with a KC-135 tanker while refueling over Palomares, Spain. Both airplanes crashed, 7 crewmen were killed, and 4 H-bombs fell, one into the Mediterranean Sea, and 3 on land, 2 of which detonated their non-nuclear explosives.
- **1968**, a B-52 carrying 4 H-bombs crashed into the sea ice off Thule Air Base, Greenland, killing one crewman, detonating the conventional explosives of all 4 bombs, and dispersing the nuclear core material.
- **1980**, at Damascus, Arkansas, a multiple warhead ICBM exploded in its silo. The nuclear material did not detonate, but there was a release of radioactive fallout.
- **1995**, Russian radar mistook a Norwegian weather rocket for a US ICBM, and an alert was sounded. A full scale launch of Russian ICBMs toward US targets was cancelled by Russian President Boris Yeltsin with minutes to spare.
- **2007**, a B-52 was accidentally loaded with 6 nuclear missiles at Minot Air Force Base, North Dakota, flown to Barksdale AFB in Louisiana, and left parked there unguarded for 36 hours, until somebody noticed.

Have all such incidents been publicly disclosed or were some kept secret? And what about Russian nuclear weapons? We really don't know. The bombs and warheads are all aging, as are planes, missiles, submarines, and associated infrastructures. The dangers of accidental detonations or unauthorized launches, combined with the chances of bombs and/or bomb making materials being lost or hijacked by terrorists, is increasing daily. Isn't it time to dismantle them all?

So, where do we stand now?

Armed and ready to strike.



\$36 billion budgeted for US nuclear weapons in 2020

Compared to previous Department of Defense budgets of \$15 billion a year on nuclear weapons delivery systems, and associated command and control just 5 years ago, and Department of Energy budgets of about \$8 billion annually for its nuclear weapons laboratories. (\$ 23 billion for both)

The budgets being proposed in Congress, for 2021 and beyond, propose to increase that by another 25%, to \$45 billion annually, for the next 30 years!

Major US Nuclear Weapons Facilities

Los Alamos National Laboratories, Los Alamos NM

Average annual budget: \$2 Billion, Staff: 10,000

This is where the A-Bomb was born. Established 1942 as primary facility of Manhattan Project. Designed, built, and tested first nuclear explosive devices, using Plutonium and Uranium 235 fuels. Trinity test was conducted near here in July 1945, and both bombs used on Hiroshima and Nagasaki were constructed here. Continuing research, design, development, and testing of nuclear weapons technology.

Lawrence Livermore National Laboratories, Livermore CA

Budget: \$1.24 Billion, Staff: 6800

Established 1952 to augment Los Alamos, developed the first nuclear warhead for US submarine-launched missiles, and first MIRVs (multiple independently targeted re-entry vehicles). Current work involves evaluation and stewardship of US nuclear arsenal.

Sandia National Laboratories, Albuquerque NM and Livermore CA

Budget: \$1.45 Billion, Staff: 10,700

Systems engineering for nuclear weapons, research and design for weapon enhancement programs.

Nevada National Security Site, near La Vegas NV

Budget: \$350 Million Staff: 1900

Formerly named Nevada Test Site, this is where 100 atmospheric & 800 underground nuclear weapons tests were conducted from 1951 to 1992. Currently engaged in non-nuclear explosive tests.

Note: These are US Department of Energy Facilities, operated by contractors. Budget figures were reported for 2015, not verified since, but expected to have increased by at least 25% by 2020.

Major US Nuclear Weapons Facilities, continued

Pantex Plant, near Amarillo TX

Budget: \$623 Million, Staff: 3600

Originally built for assembly of nuclear weapons, now primary site of disassembly of retired bombs and warheads. Also site of Life Extending Process for aging warheads, which is delaying disassembly. US is currently way behind on fulfilling its warhead dismantling commitments under START and NEWSTART treaties.

Kansas City Plant, Kansas City MO

Budget: \$500 Million, Staff: 2500

Supplies new components for existing nuclear weapons, part of Stockpile Stewardship Program.

Savannah River Site, near Aiken SC

Budget: \$1.6 Billion, Staff:12,000

Nuclear fuels production, reprocessing, and storage. A Superfund site.

Y-12 National Security Complex. Oak Ridge TN

Budget: \$870 Million, Staff: 4600

Built as part of Manhattan Project, original reactor facility for producing enriched Uranium, currently reprocessing and enrichment continues, with serious storage problems.

Hanford Site, near Hanford WA

Budget: ?, Staff: ?

First Plutonium producing nuclear reactor built in 1943 as part of Manhattan Project, now a Nuclear Superfund site, containing two thirds of the US stockpile of nuclear waste. The most heavily contaminated nuclear site in North America, and its getting worse.

Note: These are US Department of Energy facilities, operated by private contractors. Budget figures are at least 5 years old, and estimated to have increased by at least 25% since.

Who makes our bombs?

Here is a partial list of the US corporations involved in the Nuclear Weapons Industry

Aecom – management of Nevada Testing Site

ATK (Alliant Techsystems) – produces rocket propulsion systems for nuclear missiles

Babcock & Wilcox – operates Pantex nuclear weapons modernization plant

Bechtel – manages Los Alamos, Lawrence Livermore, and Y-12 complexes. Prime contractor for all nuclear weapons research, development, and enhancement

Boeing – maintenance of 500 Minuteman III ICBMs all over US, builds guidance & flight controls for silo and air-launch missiles

CH2M Hill – serves Nevada Test Site

Fluor – manages US nuclear arsenal, and tritium plant at Savannah River complex

Gen Corp – builds propulsion systems for Minuteman & Trident missiles

General Dynamics – designs, builds, & maintains US nuclear armed submarines

Honeywell - produces 85% of all non-nuclear components on nuclear weapons

Huntington-Ingalls – maintenance and modernization of nuclear weapons, manages Savannah River site

Jacobs Engineering – one third share of Atomic Weapons Establishment, which builds UK nuclear weapons

Leidas – NSA contractor, maintenance and modernization of nuclear weapons

Lockheed Martin – produces & maintains nuclear weapons for US and UK

Northrup Grumman – builds & maintains Minuteman ICBMs

Raytheon – provides electronics systems for nuclear weapons delivery

Rockwell Collins – Minuteman missile modernization

SAIC – maintenance & support for nuclear weapons facilities

TASC – provides information & security systems for nuclear weapons installations

Textron – designs & builds ICBM re-entry vehicles

URS – management at Los Alamos and Lawrence Livermore facilities



So here we are, stuck in our **Mutually Assured Destruction** standoff, the US holding 450 ICBMs, with up to 3 warheads each (1350 warheads),

14 Ohio class submarines, each of which can carry 24 Trident missiles, loaded with 4 warheads each (1150 warheads),

76 B-52 bombers, each of which can carry 8 bombs or 20 missiles,

18 B-2 bombers, each of which can carry 16 bombs,

(900-1800 airborne warheads)

And hundreds more in storage, awaiting either refurbishment or dismantling, totaling about 6500 nuclear warheads, all of them ready to go, to be launched deliberately or accidentally, or stolen, or hacked, at any time.

And Russia has about the same numbers, Britain about 225, France 300, China 240, Israel, India, and Pakistan about 100 each, and now a few in North Korea.

Does this make any sense?



Is this to be our legacy?

Current Nuclear Weapons Budget plans call for a 30 year “modernization” program, costing \$60 billion annually, or \$1.8 trillion overall, with virtually nothing for disarmament.

We do have a choice.

Right now Congress, Pentagon, and Energy Department planners are deciding whether to abide by the treaties we have signed, and resume in good faith our stated common goal of eliminating all nuclear weapons, or to renege, and build more, bigger, and better bombs.

Not knowing what future elections will bring, we are running out of time and opportunities to effect positive change in the direction our government moves.

And it is certain that Russia won't disarm without us.



Here are some organizations working towards nuclear disarmament, and all need our help.

[Ploughshares Fund](#)

[Bulletin of Atomic Scientists](#)

[Washington Against Nuclear Weapons Coalition](#)

[International Campaign to Abolish Nuclear Weapons](#)

[American Friends Service Committee](#)

[Union of Concerned Scientists](#)

[Arms Control Association](#)

[Don't Bank on the Bomb](#)

[Code Pink: Divest](#)

[Beyond the Bomb](#)

[Nuclear Voices](#)

[Ground Zero Center](#)

[International Physicians for the Prevention of Nuclear War](#)

Please check them out, and support the ones that most fit your own objectives.

We can do more than write checks and sign online petitions:

We can contact our representatives and demand an end to funding of more nuclear weapons, and swift accomplishment of our treaty obligations.

We can talk with our friends, family, and fellow citizens about the critical need for nuclear disarmament.

We can divest and encourage our friends and family to divest, in the financial institutions that are getting rich from the military industrial complex.

We can elect representatives at all levels of government that support nuclear disarmament, and then hold them to their promises.

The important thing is: WE MUST ACT , because

Congress won't do it without us



Disclosure: All images taken from the internet, without permission.

I am solely responsible for any errors or omissions.

Tracy W Powell, Fidalgo Island, Washington

Questions, suggestions? Contact me: tracy@nomorebombs.org

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