

Bikini and Enewetak Atolls, Marshall Islands

Nuclear weapons test sites

Nuclear testing on the Bikini and Enewetak atolls left entire islands uninhabitable, exposed thousands to high levels of radioactivity and contributed to global nuclear fallout.



On July 25, 1946, the U.S. Army detonated the “Baker” nuclear test bomb with a yield of 21,000 tons of TNT equivalent underwater near the Bikini Atoll. 106 nuclear tests were carried out between 1946 and 1962 on the Marshall Islands. Photo: © U.S. Department of Defense



After nuclear testing had ended, part of the Runit Island (Enewetak) was so badly contaminated that an eight meter high concrete sarcophagus was erected to seal it off. Photo: © U.S. Defense Special Weapons Agency



Evacuation of Rongelap inhabitants by the crew of the Rainbow Warrior. The “Castle Bravo” test in 1954 contaminated several islands, including Rongelap. The inhabitants were evacuated but were brought back in 1957 although the atoll was still contaminated. They were told there was no danger to them. Photo: © Greenpeace / Fernando Pereira.

History

The atolls of Bikini and Enewetak are part of the Marshall Islands and were occupied during WWII first by Japanese and later by U.S. forces. The islands were chosen by the U.S. for the first nuclear explosion after the bombings of Hiroshima and Nagasaki. On July 1, 1946, after evacuating all islanders, “Test Able” was detonated over a fleet of captured ships in order to test the effect of a nuclear bomb on enemy navies. Of the 78 vessels, 5 were sunk and 14 destroyed; one third of the animals, which had been placed on the ships, died from the blast. Sailors were ordered to scrub the fallout from the decks, exposing them to high doses of radioactivity. As decontamination was unsuccessful, many of the ships were scuttled in the Pacific.¹

Altogether between 1946 and 1958, the Bikini and Enewetak Atolls were host to 67 nuclear explosions with a total yield of about 214 megatons.^{2,3} The most devastating was the 15 megaton “Castle Bravo” hydrogen bomb test in 1954, the largest nuclear yield ever achieved by the U.S. – more than 1,000 times more powerful than the Hiroshima bomb. Nuclear fallout reached halfway across the globe – from Australia to the U.S. and Europe.⁴

More than 400 nuclear tests were conducted worldwide before the Limited Test Ban Treaty of 1963 put an end to atmospheric testing. By that time, high amounts of radioactive strontium-90 had been found in children’s teeth; a strong indication of the extent to which the entire world population had been irradiated by nuclear weapons testing.⁵

Health and environmental effects

A review of the dosimeters worn by servicemen during “routine” nuclear tests found radioactive exposition doses of up to 600 mSv during a two week mission. This dose corresponds to about 7,500 times natural background radiation (approximately 0.09 mSv over the course of two weeks) or the equivalent of 30,000 chest x-rays (0.02 mSv). Internal radiation exposure was not considered in this review.³

But not all tests were “routine”: In 1954, the “Castle Bravo” test exceeded the expected yield by 200 % and spread radioactive fallout over more than 11,000 km², contaminating several inhabited islands including Rongerik, Rongelap and Utrik, as well as a Japanese fishing vessel. Many islanders and the Japanese crew suffered acute radiation sickness from external radiation.⁴ Inhabitants of contaminated islands were evacuated a few days after “Castle Bravo,” but long-term studies showed increased levels of cancer, especially

References

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of the thyroid, most likely due to internal radiation with iodine-131.⁶

While radioactive iodine is among the most dangerous acute radioisotope spread by nuclear tests, the most significant long-term sources of radioactivity are long-lived radioisotopes such as cesium, strontium and plutonium, which were deposited over the islands by fallout. They can cause cancer through radioactive emissions inside the body once ingested or inhaled.

The atoll of Enewetak was decontaminated after the cessation of nuclear tests, with all radioactive debris sealed under an eight meter high concrete sarcophagus, dubbed “Cactus Dome.” The Bikini atoll on the other hand was deemed too contaminated for clean-up and the indigenous Bikinians had to be relocated several times, even coming close to starvation when they were sent to islands which did not yield any crops.⁷ Even in 1994, the International Atomic Energy Agency (IAEA) still found the Bikini atoll to be too radioactively polluted for resettlement, with animal and plant life still highly contaminated.⁸

Outlook

After conducting more than 1,000 nuclear tests, the U.S. stopped their nuclear test program in 1992, but has still not ratified the Comprehensive Test Ban Treaty (CTBT) which prohibits nuclear test explosions. In 1986, a 150 million dollar trust fund was set up in order to compensate Marshallese people who were exposed to fallout from nuclear testing. However, about 40 % of the affected people died without receiving their full compensation, which was in any case very little, prompting the president of the Marshall Islands to send a petition to the U.S. Congress in 2000, calling for further decontamination projects, a more inclusive compensation scheme and better health surveillance. The petition fell on deaf ears, and many islanders took legal action, but were rebuked by the U.S. Supreme Court in 2010. While their government has filed a lawsuit against the nuclear weapon states in the International Court of Justice for their failure to comply with their obligation to disarm under the Non-Proliferation Treaty, the Hibakusha of the Marshall Islands continue their fight for recognition and compensation.

